Chapter 1
System Description Specification

1. SCOPE

CPU

- Intel Ivy Bridge
- Dual Core 2.4G/2.5G/2.6G/2.8G/2.9G

Chipset

- QM77

Memory

- Support DDR3-1333MHz DDR3-1600MHz 2G/4G
- Support 2 So-DIMMS, up to Max. 8GB

Display

- 14", 3.6mm, 16:9 LED backlight LCD
- HD 1366 x 768

Graphics Chip

- No

Audio

- HD Audio, Speakers (2*1.5W), Microphone-in and Headphone-out

Camera (Option)

- 2.0M/ 1.3M Pixel CMOS Camera

Keyboard

- 86/US 87/UK 88/BZ with 101/102 key function
- 2.3 0.3mm full stroke keys, operating force 62   10g
- Overlay numeric keypad
- Support independent pgdn/pgup/home/end keys
- Support cursor keys
- Support multi-language
- Vista key supported

Hard Disk Drive (HDD)

- Support SATA3.0Gb/s
- 9.5mm height, 2.5 inch 5400/7200rpm
- Capacity from 250GB to 500GB and bigger in future

Optical Disc Drive (ODD)

- Support SATA1.5Gb/s
- Fixed 12.7mm height tray load
- DVD-ROM
- DVD Super-Multi (DVD-RAM/-R/-RW/+R/+RW), 8X write
- Support Double Layer Recording is required
- Blue-ray Combo DVD, high definition disc

Communication

- No modem

- No PCI-Express

- No WWAN

- LAN: 10/100,1000 Giga LAN

- WLAN only or W/L+BT Combo (Option)(WLAN-AMP enabled for BT3.0 compatible)

Note: For Motorola Bluetooth, please experience the BT function by Motorola's user friendly GUI, you can refer to Motorola BT help file from Taskbar --> Bluetooth icon --> Right Click on BT icon --> My Bluetooth Settings --> Help

Pointing Device

- Normal Track Pad with up/down scroll zone and two buttons

- Support Multi-finger feature

Media Slot

- 5-in-1 flash card reader (SD,MS,MMC,XD,MS pro)

I/O Ports

- USB2.0 x 3

- USB3.0 x1

- E-SATA x1

- RJ45 x 1

- VGA port x 1

- DC-in JACK x1

- HDMI x 1

- 5-in-1 flash card reader x 1

- Express card 34 x1

- Microphone-in x 1

- Headphone-out x 1

- Kensington lock x1

- Power USB Switch x1

- Wireless Switch x1

- Smart Card x1

Microphone

- Analog Type Internal Microphone

TV tuner

- NO

System Status Indicators

- 1 Caps Lock (White)

- 1 Num Lock (White)

- 1 Power Button LED (White)

- 1 LED for IDE HDD activity (Red)

- 1 LED for System status (Power On / Suspend) (Green)

- 1 LED for Battery status (Charging / Full / L1 / L2) (Green/Red)
- 1 LED for Blue tooth/Wireless Card (Green)

Control Button

- Hot Key
- Power button (support software off, 4 sec)x 1
- Power USB switch (Turn on/off Power USB function)
- Kill switch (Turn on/off Wireless and Bluetooth)
- Function button (define by customer)
- Magnetic lid switch control for system standby/ wakeup or suspend/ resume

User Keys

- No

AC Adapter

- 65W with 19V DC/3 pin 125V(EU&US) AC cable

Battery

- 6 cell/9 cell
- Li-ion, 18650 type, 4400mAh/ 4300mAh/ 5200mAh/7800mAh
- Life Cycle: 70% Design Capacity after 300 Cycles in 25degreeC

Software

- Insyde BIOS
- Suspend to DRAM/HDD
- Security: Power-On Password, Supervisor Password
- USB memory Boot support
- Support SMBIOS 2.4, PCI2.2
- Support PXE
- Wake on LAN from S3
- Wake on LAN from S4 /S5 in AC mode

OS

- Windows 7 Ultimate 32bit / 64bit

Mini Card

- One Mini card slot for WLAN Half size card

Security

- BIOS Password/ Kensington lock

Regulatory

- EMI: FCC-B, CE, VCCI, BSMI
- Safety: Compliant to UL/CSA, TUV, CB
- WHQL LOGO

Environment

- Temperature: Operating: 5 - 35°C / Storage: -20 - 65°C

- Humidity: 10 - 90% without condensation
- Altitude: Operating sea level up to 10,000 ft

  Storage sea level up to 40,000 ft

Thermal

- Thermal capacity could support TAT TDP% or 3Dmark2006 operation at 35C ambient

Application

- Driver CD W/User Manual

Chapter 2
Software
Specification

2.1 System Components Summary

1. Dimension	340 x 244 x 34.4mm
2. Weight	2.24kg
3. CPU	Intel Sandy Bridge Dual Core i3 / i5 / i7 series
4. Chipset	QM77
5. Memory	Support DDR3-1600/1333MHz 1G/2G/4G Support 2 So-DIMMS, up to Max. 8GB(4GB*2) No on board memory
6. Optical Device (Option)	Fixed 12.7mm height SATA ODD DVD Super-Multi (DVD-RAM/-R/-RW/+R/+RW), 8X write
7. HDD	Support SATA3.0Gb/s 9.5mm height, 2.5 inch 5400/7200rpm Capacity from 250GB to 500GB and bigger in future
8. Display	3.6mm, 14" (16:9) HD (1366 x 768) LED type backlight LCD 200nits (5 Points Average) with 8ns response time
9. GPU (Option)	W/O GPU for UMA SKU
10. Audio	SRS support HD Audio One Audio in port One Audio out port (headphone out, no SPDIF support) Internal Microphone (Option with Internal Camera, MIC with echo cancellation) Software EQ support Synchronize to change sound output to HDMI
11. Speaker	2 stereo speakers (1.5W x 2)
12. Express Card Slot	One Express card slot 34mm only
13. Smart Card	Smart Card support

14. Bridge Media Slot	Support 5 in 1(push-push type)
	  - SD
	  - MS
	  - MMC
	  - xD
	  - MS pro

15. Communication	No modem Giga LAN
16. WLAN + BT Combo	WLAN only or W/L+BT Combo

17. Security	BIOS Password / Kensington lock / Camera door Fingerprint Support for TPM 1.2
18. Internal Camera	1.3M/ 2.0M Pixel CMOS Camera With camera door
19. Keyboard	86/87 keys support with 101/102 key emulation without stick-point Windows key, Application key Standard pitch, 2.5mm travel length Multi-Language support
20. Pointing Device	Normal Track Pad with up/down scroll zone and two buttons Support Multi-finger feature Touch PAD ON/OFF button
21. I/O Ports	USB2.0 x 3 USB3.0 x1 E-SATA x1 RJ45 x 1 VGA port x 1 DC-in JACK x1 HDMI x 1 5-in-1 flash card reader x 1 Express card 34 x1 Microphone-in x 1 Headphone-out x 1 Kensington lock x1 Power USB Switch x1 Wireless Switch x1 Smart Card x1
22. Microphone	Internal Microphone
23. System Status Indicators	1 Caps Lock (White) 1 Num Lock (White) 1 Power Button LED (White) 1 LED for IDE HDD activity (Red) 1 LED for System status (Power On / Suspend) (Green) 1 LED for Battery status (Charging / Full / L1 / L2) (Green/Red) 1 LED for Blue tooth/Wireless Card (Green)
24. User Keys	Hot Key Power button (support software off, 4 sec) x 1 Touch pad ON/OFF button x 1 Power USB Switch x 1 Function button x 3
25. AC Adapter	65W for UMA Power cord 1.8m
26. Battery	6 / 9cell (Leverage from NCL50) with quick charge support Li-On, 18650 type, 4300mAh / 4400mAh / 5200mAh / 7800mAh

27. Software	Insyde BIOS Suspend to DRAM/HDD Security: Power-On Password, Supervisor Password USB memory Boot support Support SMBIOS 2.4, PCI2.2 Support PXE Wake on LAN from S3 Wake on LAN from S4 /S5 in AC mode
28. OS	Windows 7 Ultimate 32bit / 64bit
29. Mini Card	Half size x 1 (WLAN only or W/L+BT Combo)
30. Regulatory (TBC)	EMI: FCC-B, CE, VCCI, BSMI Safety: Compliant to UL, CB, BSMI Energy Star / WHQL LOGO
31. Environment	Temperature: Operating: 5 - 35°C / Storage: -20 - 65°C Humidity: 10 - 90% without condensation
32. Thermal	1. Thermal capacity @ 35 C ambient: a. Execute 3Dmark06 or TAT TDP% CPU no throttling 2. Components @ 35 C ambient: a. Execute 3Dmark06 or TAT TDP% , all components pass thermal spec 3. Skin spec. @ 25 C ambient: Execute 3DMark2006 demo a. Logic lower $\triangle$T< 25 deg. C (Discrete) and 23 deg. C (UMA) b. Palm rest & Touch pad $\triangle$T<12 deg. C c. Keyboard & keyboard rest $\triangle$T<15 deg. C d. Strip cover $\triangle$T<20 deg. C e. I/O port $\triangle$T< 25 deg. C
33. Application	Driver CD W/User Manual WSED SRS AP

2.2 System Controls

2.2.1 Buttons

2.2.1.1 Power Button

The activity of the power button is as follows:

- If system is Off/Hibernate: System will be turned on while Power switch is depressed by more than 100 ms
- If system is in Standby state: System will resume while Power switch is depressed by more than 100 ms.
- If system on with legacy mode: depress this button will turn off power.

If system is running in ACPI OS, the power button acts as the sleep button, and let OS controls the policy of power button which is defined in Power Option under the

OS.2.2.1.2 Power Button Over-ride

Holding down the Power Button for 4 seconds will cause an unconditional transfer to the off state without notifying the operating system.

2.2.1.3 Lid switch

If the system is running under legacy mode:

- Closing the lid will turn off LCD backlight.

If the system is running under ACPI mode:

- The operating system will determine what action to take when the lid is opened and closed.

The function of lid switch will follow the OS setting in power management (Nothing, Standby or Hibernate). If nothing, the backlight must turn off when the lid is closed.

2.2.1.4 System status indicators

Please refer to Keyboard BIOS specification.

2.3 Core BIOS Features

2.3.1 Multi Boot

The notebook can support Multi-Boot for selecting the boot sequence of Hard Drive, Removable Devices, CD-ROM/DVD Drive and Network in Setup.

2.3.2 Quiet Boot

Quiet Boot replaces the customary technical messages during POST with a more visually pleasing and comfortable display (OEM screen). During POST, right after the initialization of VGA, The notebook displays an illustration called the OEM screen during system boot instead of the traditional POST screen that displays the normal diagnostic messages.

The OEM screen stays up until just before the operating system loads unless:

- Pressing <Esc> to switch to the POST screen and the boot process will continue until the end of POST.

- Pressing <F2> to enter Setup.

- Pressing <F12> to enter Boot Menu.

- Whenever POST detects a non-terminal error, it switches to the POST screen near the end of POST, just prior to prompting for a password.

- If the BIOS or an option ROM request keyboard input, the system switches over to the POST screen with prompts for entering the information. POST continues from there with the regular POST screen.

2.3.3 Boot Block

The Flash ROM used in many systems today offer the customer the advantage of electronically reprogramming the BIOS without physically replacing the BIOS ROM. This advantage, however, does create a possible hazard: power failures or fluctuations that occur during updating the Flash ROM can damage the BIOS code, making the system unbootable. To prevent this possible hazard, many Flash ROM include a special non-volatile region that can never be erased. This region, called the boot block, contains a fail-safe recovery routine. If the boot block finds corrupted BIOS, it prompts the end user to insert a diskette, from which it loads several files that replace the corrupted BIOS on the Flash ROM with an uncorrupted one.

2.4 Thermal management

Please refer to Keyboard BIOS specification.

2.5 Power Management for ACPI mode

2.5.1 Introduction

The notebook supports ACPI. The system will dynamically switch to ACPI mode for configuration and power management when an ACPI OS is loaded.

When ACPI is not loaded and enabled, the power management function will be disabled.

2.5.2 System Time-outs

If the system is running in ACPI mode, system Time-outs is handled by the operating system. BIOS time-outs are disabled. System time-outs are set using the control panel power applet.

2.5.3 System Power Management

The overall system can be in one of the system power states as described below:

ACPI mode	Power Management
Mech. Off (G3)	All devices in the system are turned off completely.
Soft Off (G2/S5)	OS initiated shutdown. All devices in the system are turned off completely.
Working (G0/S0)	Individual devices such as the CPU and hard disk may be power managed in this state.
S3 Sleeping State	CPU set power down VGA Suspend New Card Suspend Audio Suspend Hard Disk Power Down ODD Power Down Super I/O Power Down
S4 Sleeping State	System Saves all system states and data onto disk prior to power off the whole system.

2.5.4 Device Power Management

Under ACPI mode, the device specific power management supported by this notebook includes the CPU throttling, monitor power management and the hard disk.

2.5.4.1 CPU power management

- ACPI mode

The operating system detects when the system is idle and places the CPU in one of the 3 CPU low power states (C1, C2, C3 up to C6) depending on how much latency it believes the system can afford.

The C1 state is simply the CPU halt instruction.

The C2 state is the CPU stop grant state.

The C3 state is the CPU stops clock state.

The CPU stays in this state until an interrupt occurs.

2.5.4.2 Hard Disk

The operating system uses the spin down timer of the hard drive to set time-outs. The BIOS time-out of the hard disk must be disabled in ACPI mode. The user can sets the hard disk spin down time-out in the control panel power applet.

2.5.4.3 Display Device

The monitor can be turned off after a period of no activity based on the settings of the OS.

2.5.4.4 **System Up Sources**

The table below lists the wake up events for all low power states:

Events	S3	S4	S5	Process required
Internal Keyboard	Yes	No	No	No
Internal pointing device	No	No	No	No
USB	No	No	No	No
Lid Switch	No	No	No	No
Power button	Yes	Yes	Yes	No
LAN (On board)	Yes	Yes(AC mode only)	Yes(AC mode only)	Yes
RTC	Yes	Yes(AC mode only)	Yes(AC mode only)	Yes
Critical low battery	Yes	No	No	Yes

Field 'Process required' identifies that further process for the occurred events must be processed during wake up or resumes procedure.

2.5.4.4.1 LAN

LAN (On board)

S3(Standby): LAN is supported wake-up from S3 **w/ AC/DC mode**
S4(Hibernation)/S5: LAN just only support wake-up from S4/S5 **w/ AC only**
BIOS will enable or disable WOL based on device manager setting.

2.5.4.4.2 Real Time Clock Alarm

The Real Time Clock alarm interrupt will wake the system from Standby (DC/AC), Hibernation (AC mode only) and S5 (AC mode only).

2.5.4.4.3 Critical Low Battery

Critical low battery event can wake the system from Standby (DC mode) in ACPI mode.

2.5.5 Hibernation

To support the hibernate state, the save to disk partition or file will be created by the operating system if the user select to enable the hibernation.

It is the responsibility of the operating system to save the system state to a disk file and restore the system state when it is turned back on.

2.6 ACPI (Advanced Configuration and Power Interface)

2.6.1 Introduction

The Advanced Configuration and Power Interface (ACPI) is a well-specified power management and configuration mechanism. It evolves the existing collection of power management codes, APM, PnP BIOS, and Etc.

2.6.2ACPI Sleep Status

BIOS must support the following sleep states – S3, S4 and S5.

2.6.3 Fast Resume

BIOS must hands off the control to the operating system within the following time limits:

	Required
S3->S0	2seconds

*Measured using the Microsoft **VTS (Velocity) tool.**
In addition, total resume time from S3 must be completed within 5 seconds.

2.6.4 Power State Transition Diagram

The state transition diagram in ACPI mode is as follows:

From (State)	Leave By Condition	Enter (State)
S3	Power Button	S0
	Internal Keyboard	
	RTC Alarm	
	On board LAN (WOL)(*1)	
S3	Battery Critical Hibernation trip point reached (*2)	S4
	The timer timeout after the inactivity of selected timer in power scheme, System Hibernate, reaches the setting (*2)	
S4	Power Button	S0
	On board LAN (Only in AC mode)	
	RTC Alarm(Only in AC mode)	
S5	Power Button	S0
	On board LAN (Only in AC mode)	
	RTC Alarm(Only in AC mode)	
S0	Press Lid switch / Sleep Button (Fn+F2) / Power Button (depends on ACPI OS setting)	S3
	User selects the Standby Option in the Windows Shut Down menu	

	ACPI OS timer expired	
	Critical /Low battery (depends on ACPI OS setting)	
S0	Press Lid switch/ Sleep Button (Fn+F2) / Power Button (depends on ACPI OS setting)	S4
	User selects the Hibernate Option in the Windows Shut Down menu	
	Critical /Low battery (depends on ACPI OS setting)	
S0	Press Lid switch / Power Button (depends on ACPI OS setting)	S5
	The Power Button is pressed for 4 seconds (Power Button Override)	
	User selects the Shut down Option in the Windows Shut Down menu	
	Critical /Low battery (depends on ACPI OS setting)	
	Thermal critical shutdown performed by EC firmware	

Note1: The backlight of LCD should be off when WOL from S3 as it is remote wake up.

Note2: the S3 　S4 transition results in the system transitioning to the S0 state first so OS can save the context to the hard disk. The system BIOS/KBC will not be involved for S3 S4 transition. The system power scheme will wake the machine from S3 and then transition to S4 Hibernation. The backlight of LCD is off during this transition.

2.6.5 Storage Devices and Batteries

Possible storage devices are FDD, HDD, CD-ROM and DVD-ROM

- Floppy Disk and Hard Disk, CD-ROM and DVD-ROM

The BIOS must report the correct types of these devices if the drive is installed in the system during POST. Two devices, which belong to the same category, are not supported in this notebook.

- Batteries

The BIOS must follow ACPI specification and report the correct number of the installed battery and status.

2.6.6 Bootable Device

The system is capable of booting from onboard HDD, external USB Floppy and USB ATA Flash device.

2.6.7 Embedded controller

The keyboard controller will act as the ACPI embedded controller and support the ACPI EC protocol and interface.

2.7 PC2001

The notebook must meet Microsoft Logo requirements in accordance with the PC2001 Guide and the Microsoft Logo test programs.

2.8 Miscellaneous Features

2.8.1 BIOS ROM

It depends on the platform design architecture (sharer ROM or Non-Sharer ROM, Intel ME SKU and so on).

Non-Sharer ROM: SBIOS and EC BIOS have each SPI ROM chip separately, the EEPROM is inside EC BIOS area, BIOS will copy a full set of EEPROM data to SBIOS ROM at the first POST or EEPROM data is updated to speed up the EEPROM access.

Sharer ROM: The EC BIOS, EEPROM and SBIOS are all inside one SPI ROM chip.

2.8.2 USB Support

This feature allows the use of a USB keyboard to access BIOS Setup and to be used in DOS without additional drivers. USB floppy boot and Crisis Recovery from USB floppy is also supported. The driver provides other USB devices support after loading the operating system.

2.8.3 Flash utility – one BIOS **file** only

The flash utility can be used to program both system and keyboard BIOS at the same time. Before flash BIOS you must make sure that AC exist. Or you will be forbidden to flash BIOS.

2.8.4 Crisis Recovery

This feature provides an opportunity for system that cannot boot up. With a crisis floppy diskette, the system can perform crisis recovery by using internal PS2 keyboard.

To perform crisis recovery using keyboard, do the following:

Power off the system.

Plug-in the USB floppy drive with crisis floppy diskette inserted.

Hold down Fn + B keys.

Plug-in AC adapter and make sure it is powered.

Power on the system from off state (i.e. cold boot) while holding down <Fn+B> key.

After POST, release <Fn+B> key. The system should boot from floppy and perform crisis recovery action.

2.8.5 VGA Support

This section describes the expected behavior when a video monitor is connected to the VGA port on the notebook .The feature needs VGA driver support.

The BIOS will use both the RGB and pin 11 methods to determine the presence of an external VGA monitor.

Video modes supported on the secondary display path (need VGA driver support)

Supported video modes and timings please refer to the technical reference of VGA vendor. In particular, text mode and standard VGA modes are not supported.

2.8.5.1 Brightness table

This section describes the LCD Brightness control.

The keyboard Fn+F4 and Fn+F5 keys, the AC/DC state and the brightness slide bar in *Windows Mobility* Center control the LCD brightness.

There shall be 11 levels of distinct brightness.

Level 11 = Maximum Brightness possible.

Level 1 = Minimum brightness without flickering (10 nits recommended, depending on inverter stability, type and display uniformity)

*One setting level should be approximately 55 – 60 nits for Mobile Mark 2002 test.

2.8.5.2 Boot Display Algorithm

This section describes the POST boot up display device with multi display device attached.

System support Local Flat Panel display during POST when LFP attached,

the external display device (Include VGA, DVI, HDMI and DP) will display at the same time.

2.8.6 Fast Boot

The BIOS POST time should be within 5 seconds or less. The BIOS POST time is measured by Microsoft Velocity Test Suite. The POST timing test needs to include the worst-case drive configuration (internal or external) and worst-case memory configuration available via the retail channels.

The POST time testing environment does not include attachable devices such as USB keyboards, external monitors, printers, PC Cards, Port Replicators and etc.

Note: if have TPM device, the BIOS POST Time should add extra 300 microseconds for initial.

2.8.7 Wireless Control

BIOS should report the wireless device (include WLAN and BT) exist and enable status to the EC namespace for the Kill Switch support.

2.9 Customer Specific Features

2.9.1 Display of System Type and BIOS Version Number on Boot

The development BIOS Version should start from 0.01 and the formal BIOS for MP should start from 1.00.

2.9.2 CMOS RAM management

For UEFI Code, CMOS just reserve for kernel code/Chipset code, the variable storage had been replaced by flash part.

2.9.2.1 CMOS Requirement for Debug Purpose

For debug purpose, BIOS could save data to CMOS NV0 (access by port 70h/71h) offset 48h-4Fh, 6Ch-6Fh and 70h-7Fh, NV1 (access by port 72h/73h) offset 40h-57h and 60h-7Fh which are reserved for OEM use.

2.9.3 System Management BIOS(SM BIOS) version 2.7 (DMI 2.0)

Limited DMI 2.0 BIOS information is provided:

BIOS version number is type 0 data item.

Type 1:

- System serial number – 64 alphanumeric characters with 12-character bundle number
- System manufacturer name – 16 alphanumeric characters
- System product name – 32 alphanumeric characters
- System version – 32 alphanumeric characters
- UUID – 32 Hexadecimal numbers

Type 2:

1. System manufacturer name – 16 alphanumeric characters
2. Motherboard Product name – 'XXX'
3. System serial number – 64 alphanumeric characters with 12-character bundle number

Type 3:

4. System manufacturer name – 16 alphanumeric character
5. System serial number – 64 alphanumeric characters with 12-character bundle number
6. Asset tag number – 128 alphanumeric characters

2.9.3.1 Default SMBIOS Value

Name	Default Value
System Serial Number	123456789
Manufacturer name	Compal
System version	*F.01*
System product name	%project code%

2.9.4 EEPROM

There is one EEPROM that is used to store many important system and user data in the notebook (some data are reserved for future to use)). The size of the EEPROM is 2K bytes.

The EEPROM map is listing as below:

Name	Offset	Comments
System Serial Number	00h – 1Fh	32 bytes of Serial number.
	20h – 3Fh	32 bytes of Bundle number.
Manufacturer name	40h – 4Fh	16 bytes for DMI type 1/2/3
System version	50h – 6Fh	32 bytes of System version for DMI type 1.
UUID	70h – 7Fh	16 bytes for UUID for DMI type 1.
System product name	80h – 9Fh	32 bytes of System product name.
DMI type 11	A0h – DDh	62 bytes for DMI type 11
OS_SKU	DEh	1 byte for OS type
Unused	DFh	Unused
GUID	E0h – E7h	8 bytes for GUID
Born On Date	E8h – EAh	3 bytes for born on date
EEPROM initialize flag	EBH	Set to AAh when the EEPROM get initialized.
Reserved	ECh - EFh	Reserved
Keyboard type	F0h	Define for US/UK/JP keyboard
Keyboard BIOS used	F1h	1 byte for Keyboard BIOS used
Branding	F2h	1 byte for Branding.
KMS	F4h	KMS active flag
Reserved for keyboard	F5h – F6h	Reserved 2 bytes for keyboard used
Unused	F7h – FDh	Unused
Assettag number	200h – 23Fh	64 bytes for DMI Type 3
LAN MAC Address	240h – 245h	6 bytes for LAN without EEPROM
Unused	246h – 25Fh	Unused
ACPI OEM ID	260h – 265h	6 bytes for ACPI OEM ID
Unused	266h – 26Fh	Unused
ACPI OEM Table ID	270h – 277h	8 bytes for ACPI OEM Table ID
Reserved	278h - 7FFh	Reserved

2.9.5 OEM Active 1.0/2.0/2.1 and KMS **activation support**

OEM Activation 1.0 (a.k.a. SLP 1.0) is used to activate Windows XP. To support it, BIOS needs to populate OEM string in the 0xF000 segment during POST.

OEM Activation 2.0 (a.k.a. SLP 2.0) is used to activate Windows Vista. To support it, BIOS needs to populate ACPI SLIC table during POST.

For projects supports Windows 7, SLP 2.1 is required to support.

MS claims the Windows marker is MS's IP and cannot appear on non-Windows OS SKUs. An EEPROM flag OS_SKU (refer Sec. 4.10.4) is defined to indicate the machine is shipped with Windows or non-Windows OS. The flag is programmed in the factory and BIOS needs to read this flag when populating OEM string/ACPI SLIC table. If the flag indicates the machine is

shipped with non-Windows OS, BIOS will not load Windows marker structure in ACPI SLIC table.

KMS Activation support.

To support the KMS activation, the SLIC table should be removed from the ACPI table.

To support multi customer, BIOS should remove the SLIC table as default, and populate the SLIC table if customer enter the OEM ID, OEM table ID and OS_SKU in the EEPROM. The customer should create customized BIOS with SLP2.0/2.1 market and public key at the same time to active Vista/Window 7. Please refer to the "How to update OEM SLP" for the detail instruction of customized BIOS creation.

2.9. 6 Multi Customer Logo Support

To support Multi customer Logo, BIOS will merge dummy OEM logo in BIOS as default, and customer should create customized BIOS with OEM Logo. Please refer to the "How to update OEM Logo" for the detail instruction of customized BIOS creation.

2.10 System Setup

2.10.1 Invoking setup

The setup function can be invoked by pressing F2 when "Press <F2> to enter Setup" message is prompted on the bottom of screen during POST.

During setup, all Fn function keys and power saving functions are disabled.

2.10.2 Main Menu

InsydeH20 Setup Utility			
Main Advanced Security Boot Exit			
System Time	[12:00:00]		
System Date	[01/01/2009]		
Processor Type	Type,XXXGHZ		
System Memory Speed	XXXMHz		Details see the following
Total Memory	XXX MB		Help Information
EC version	X.XX		
System BIOS Version:	X.XX.XX		
Intel ME Version	X.X.XX.XXXX		
Hard Disk0:	XXXXXX		
CD/DVD Rom:	XXXXXX		
Removable Device State:	XXXXXX		
Serial Number	XXXXXX		
UUID	XXXXXX		
F1 Help	↑↓ Select Item	F5/F6 Change Values	F9 Setup Defaults
Esc Exit	←→ Select Screen	Enter Select ▸ SubMenu	F10 Save and Exit

System Time and System Date

The hour is displayed with 24-hour format. The values set in these two fields take effect immediately.

Processor Type

This field shows CPU type and speed.

Total Memory

This field reports the memory size of the extended memory with an integer in the system.

Serial Number

This field displays the serial number, max size support to 32 bytes.

UUID

This field display the UUID, the length is 16 bytes.

Help information

System Time

[hh:mm:ss]This is the help for the hour field. Valid range is from 0 to 23.
INCREASE/REDUCE:+/-.

[hh:mm:ss]This is the help for the minute field. Valid range is from 0 to 59.
INCREASE/REDUCE:+/-.

[hh:mm:ss]This is the help for the second field. Valid range is from 0 to 59.
INCREASE/REDUCE:+/-.

System Date

[mm:dd:yy]This is the help for the month field. Valid range is from 1 to 12.(Error
checking will be done against month/day/year combinations that are not
supported.) INCREASE/REDUCE:+/-.

[mm:dd:yy]This is the help for the day field. Valid range is from 1 to 31.(Error
checking will be done against month/day/year combinations that are not
supported.) INCREASE/REDUCE:+/-.

[mm:dd:yy]This is the help for the year field. Valid range is from 2000 to 2099.(
Error checking will be done against month/day/year combinations that
are not supported.) INCREASE/REDUCE:+/-.

2.10.3 Advanced

InsydeH20 Setup Utility		
Main **Advanced** Security Boot Exit		
Num lock	<Off>	
Peripheral Configuration		
VT	<Enabled>	Details see the following Help Information
Configure SATA as	<AHCI>	
Express Card	<Enabled>	
POST Hotkey Delay	<0>	
UMA Share Memory Size	<32MB>	
Power On Display	<LCD>	
USB Legacy	<Enabled>	
INTEL Anti-Theft Technology Configuration		
TXT	<Disabled>	

F1 Help	↑↓ Select Item	F5/F6 Change Values	F9 Setup Defaults
Esc Exit	←→ Select Screen	Enter Select ▸ SubMenu	F10 Save and Exit

Numlock

Enter this menu, you can choose the ON or Off in this submenu. This function just works under DOS. In OS number lock is controlled by EC.

Peripheral Configuration

Enter this menu, it can display the submenu:

"Bluetooth   <Enable>"

"Wlan   <Enable>"

"Camera   <Enable>"

"Card Read   <Enable>"

"Azalia   <Auto>"

You can select Enabled or Disabled in the above submenu, and in the submenu "Azalia <Auto>" you also can select Auto, Enable or Disable.

Configuration SATA as

Choose HDD mode through selecting the IDE mode or AHCI mode.

Express Card

You can select the Disabled or Enabled in this menu according to the owner requests.

VT

You can select the Disabled or Enabled in this menu.

UMA Share Memory Size

You can select the share memory size for UMA use, 32MB/64MB/128MB could be selected.

USB Legacy

You can select the Disabled or Enabled in this menu according to the owner requests;

INTEL Anti-Theft Technology Configuration

Intel(R) AT Support System   <Enabled>

Intel(R) AT Recovery   【3】

Intel(R) AT Suspend   <Disabled>

TXT

You can select the Disabled or Enabled in this menu.

Help information:

Num Lock

Selects   Power-on state for Num lock.

Peripheral Configuration

Configures the peripheral devices.

VT

Virtualization Technology Enable/Disable.

Configure SATA As

Set Harddisk Controller Configure Type.

Express Card

Control the PCI Express Root Port.

POST HotKey Delay

Customizable amount of time for the user to press HotKey at POST.

UMA Share Memory Size

Select DVMT5.0 Pre-Allocated(Fixed) Graphics Memory size used by the Internal Graphics Device.

USB Legacy

 USB devices boot and access in DOS.

2.10.4 Security Menu

This menu shows the security setting, such as TPM, User and Supervisor Password, HDD Password and Power on Password.

InsydeH20 Setup Utility			
Main Advanced **Security** Boot Exit			
TPM Status	Enabled and Active	Details see the following Help Information	
TPM Operation	[No Operation]		
TPM Force Clear	[Enabled]		
Supervisor Password :	Clear		
Set Supervisor Password			
Power on Password	[Disabled]		
F1 Help	↑↓ Select Item	F5/F6 Change Values	F9 Setup Defaults
Esc Exit	←→ Select Screen	Enter Select ▸ SubMenu	F10 Save and Exit

TPM Status
Show the TPM status: "Enable and Active" or "Disable and Inactive"
TPM Operation
Enable/Disable TPM Function. This option will automatically return to No-Operation.
TPM Force Clear
This item will show when the TPM Operation be set "Enable and Active", used to enable/disable
TPM Force Clear function.

Supervisor Password

> Show the Password status: Clear or Set

Set Supervisor Password

> Install or Change the password.

Power on Password

> Enable or disable the Power on Password. You only can enable/disable Power on password after the Supervisor password is set.

Help information

Set Supervisor Password

> Install or change the password and the length of password must be greater than one word.

Power on password

> Enable: System will ask input password on post time. Disable: System will ask input password when go to Setup Utility

Password behavior

Supervisor Password and Power on Password

> After set the supervisor password, power on password can enable or disable.

> If only set the supervisor password, system will request supervisor password before entering setup menu(F2). Users have 3 chances to input supervisor password, system will request shutdown if users input wrong password 3 times.

> If set power on password, system will request the password after power on the machine . Users have 3 chances to input power on password, system will request shutdown if users input wrong password 3 times.

2.10.5   Boot Menu

This menu allows the user to decide the order of boot devices to load the operating system. Bootable devices include the diskette drive in module bay, the onboard hard disk drive in module bay.

InsydeH20 Setup Utility	
Main Advanced Security **Boot** Exit	
Boot priority order:	
Floppy Drive : XXXXXXXXXX	
Hard Disk Drive0 : XXXXXXXXXX	Details see the following Help Information
Hard Disk Drive1 : XXXXXXXXXX	
CD/DVD-ROM Drive: XXXXXXXXXX	
USB HDD : XXXXXXXXXX	
USB CDROM : XXXXXXXXXX	
Network boot: XXXXXXXXXX	
Boot Device Status：	

Floppy Drive	<Enabled>		
CD/DVD-ROM Drive	<Enabled>		
Network boot	<Enabled>		
F1 Help	↑↓ Select Item	F5/F6 Change Values	F9 Setup Defaults
Esc Exit	←→ Select Screen	Enter Select ▶ SubMenu	F10 Save and Exit

Help information

Use <>or <¯ > to select a device, then press <F5> to move it down the list, or <F6> to

Move it up the list. Press <Esc> to escape the menu.

2.10.6 Exit Menu

InsydeH20 Setup Utility			
Main Advanced Security Boot **Exit**			
Exit Saving Changes			
Exit Discarding Changes			
Load Optimal Defaults		Details see the following Help Information	
F1 Help	↓ Select Item	F5/F6 Change Values	F9 Setup Defaults
Esc Exit	←→Select Screen	Enter Select ▶ SubMenu	F10 Save and Exit

Exit Saving Changes

Allows the user to save changes to NV Storage and reboot system. The following message

is prompted when user press "Enter" on the item.

```
Exit Saving Changes?

[Yes]      [No]
```

Yes: Save Changes, Exit SETUP and reboot
No: Back to previous screen

Exit Discarding Changes

Allows the user to discard changes and continue the boot operation. The following message is prompted when user press "Enter" on the item.

```
Exit Discarding Changes?

[Yes]      [No]
```

Yes: Discard Changes and Continue the boot operation.

No: Back to previous screen

Load Optimal Defaults

Allows the user loads default value in CMOS Setup. The following message is prompted when user press "Enter" on this item:

```
Load Optimal Defaults?

[Yes]      [No]
```

It still stay in Setup when press a key.

Help information

Exit Saving Changes

Exit system setup and save your changes.

Exit Discarding Changes

Exit system setup and without saving your changes.

Load Optimal Defaults

Load Optimal Defaults.

2.11 OS Compatibility

Windows 7 (32bits and 64bits)

Chapter 3
Hardware

1. Major Sub-assembly Specification

System interconnection

1.1 Top View (For QAQ12)
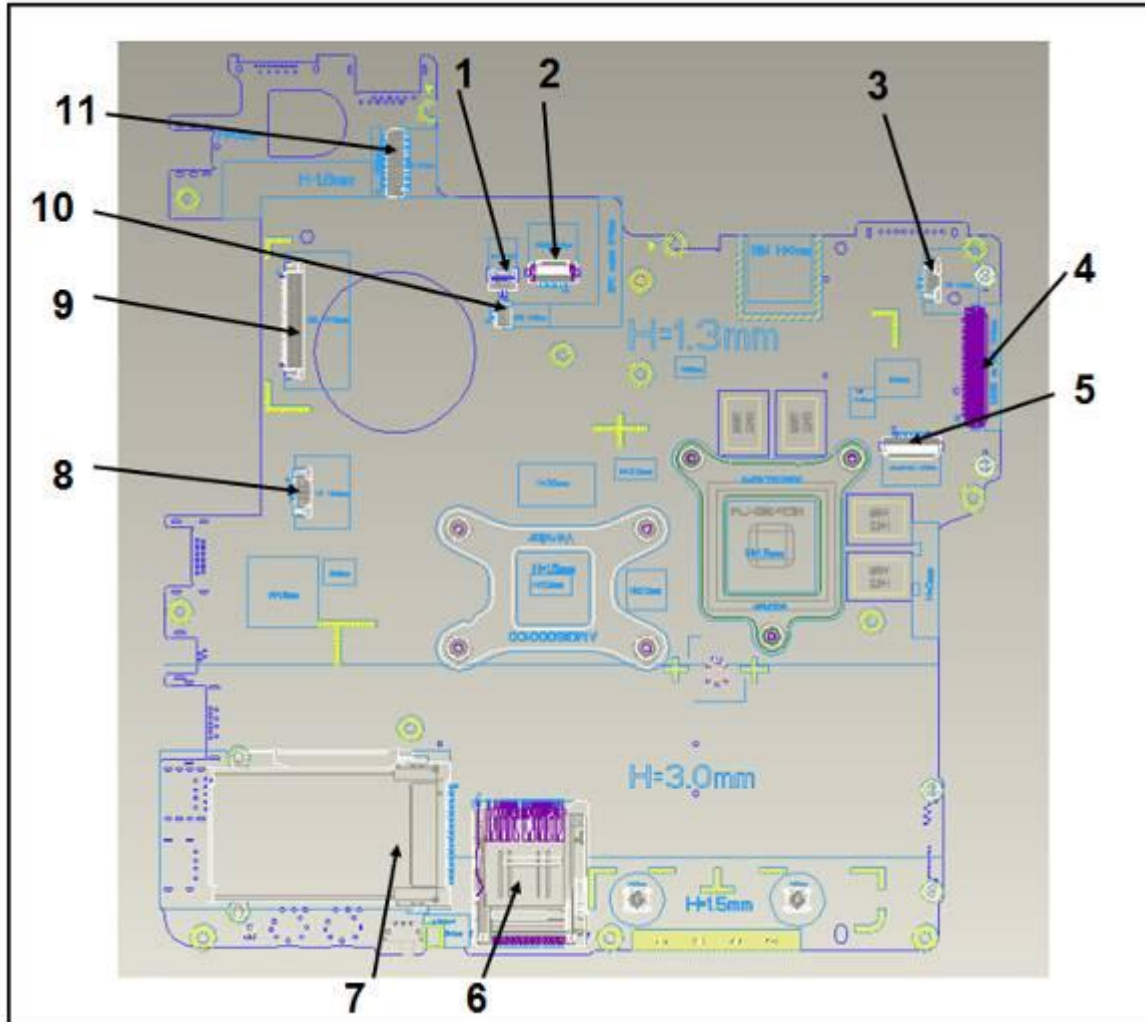
NO	Description
1	Mic Conn
2	Power Board Conn
3	Finger Print Board Conn
4	USB Board Conn
5	Smart Card Conn
6	5 in 1 Conn
7	NEW card Conn（with socket）
8	TP Conn
9	K/B Conn
10	Speaker Conn
11	LVDS Conn

1.2 Bottom view (For QAQ12)
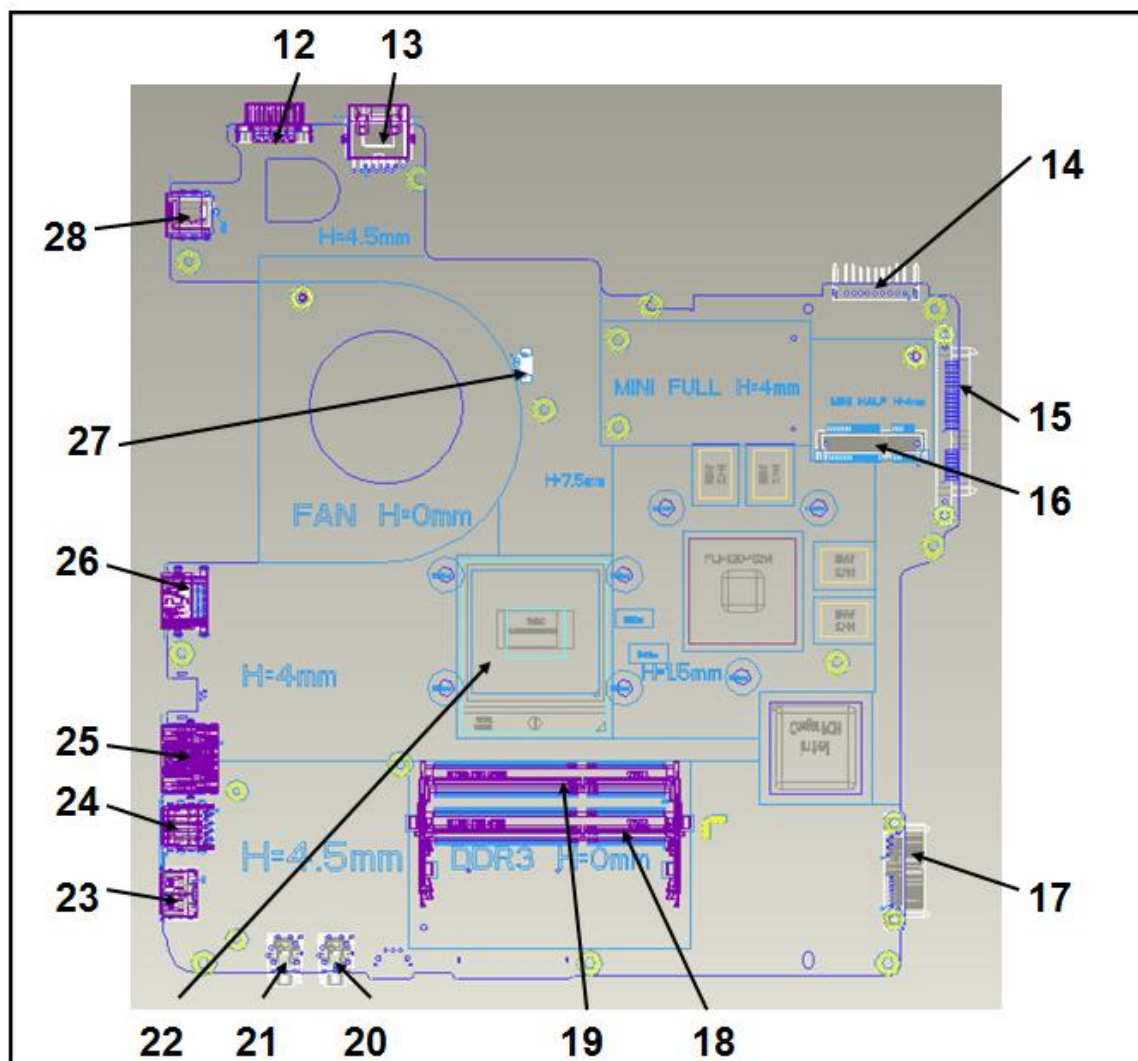
NO	Description	NO	Description
12	D-Sub Conn	21	Audio Jack Conn
13	RJ45 Conn	22	CPU Socket Conn
14	Battery Conn	23	USB2.0 Conn
15	S SATA HDD Conn	24	USB3.0 Conn
16	MINI Card Conn	25	ESATA Conn
17	SATA Odd Conn	26	HDMI Conn
18	DDR3.0(H=4.0) Conn	27	Fan Conn
19	DDR3.0(H=8.0) Conn	28	DC-IN conn
20	Audio Jack conn	29	

Chapter 4
DC-DC CONVERTER

4.1 DC/DC Power Plane

	V_min	V_typ	V_max	Vripple	I_min	I_typ	I_max	I_peak
+3VALWP	+3.15V	+3.3V	+3.46V	0.1V	0A	2.1A	3.0A	4.8A
+5VALWP	+4.75V	+5.0V	+5.25V	0.1V	0A	2.8A	4.5A	6.62A
+1.5VP	+1.42V	+1.5V	+1.57V	0.06v	0A	9.8A	14A	16.9A
+1.8VSP	+1.71V	+1.8V	+1.89V	0.9V	0A	1.3A	2.1A	3A
+VCCP	+0.9975V	+1.05V	+1.10V	0.04v	0A	9.8A	14A	18A
+0.75VSP	+0.71V	+0.75V	+0.787V	0.375V	0A	0.4A	0.5A	0.6A
+VCCSA	+0.855V	+0.9V	+0.945V	0.02V	0A	4.2A	6A	7.65A
VGA_CORE	+0.85V	+0.95V	+0.975V	0.05V	0A	14A	20A	25A
CPU_CORE	+0.3V	+1.25V	+1.35V	0.06V	0A	37A	53A	70A
GFX_CORE	+0.0V	+1.28V	+1.3V	0.06V	0A	14A	20A	40A
Fast Charge (LI-ION) 6Cell	+12V	+12.6V	+13.05V	0.15V	2.95A	3.114A	3.42A	
Fast Charge (LI-ION) 9Cell	+12V	+12.6V	+13.05V	0.15V	2.95A	3.114A	3.42A	
VIN current	+18V	+19V	+20V		4.52A	4.74A	4.98A	

Protection:
OVP:
+5VALWP: 5V *(108% ~ 114%)
+3VALWP: 3.3V *(112% ~ 120%)
+1.05VCCP: 1.05V*(111% ~ 119%)
+1.5VP: 1.8V*(111% ~ 119%)
+VCCSA: 0.9V*(111% ~ 119%)
VGA_CORE: over 60mV of programmed VID level
CPU_CORE: over 160mV of programmed VID level
GFX_CORE: over 160mV of programmed VID level

OCP:
+5VALWP: 8.32A
+3VALWP: 6.88A
+1.05VCCP: 19.6A
+1.5VP: 13.4A
+1.8VSP: 4.88A
+VCCSA: 9.8A
VGA_CORE: 29.6A

4.2 Interface between Power with M/B

Signals	I/O	Voltage Level	Description
DC/DC			
SUSP#	I	0~5V	Low Active, system suspend control signal
51ON#	I	0~floating	Low Active, POWER ON control signal.
VS	I	0~3.3V	High Active, RT8205 use this pin to control the +3/5V_ALWP.
FSTCHG	I	0~5V	High Active, ISL6251 use this pin to control the fast charge of charger.
CHGVADJ	I	0~3.3V	High Active, ISL6251 use this pin to control the battery voltage.
IREF	I	0~3.3V	High Active, ISL6251 use this pin to control the battery current.
ADP_I	O	0~3.3V	High Active, ISL6251 send signal to EC control the adapter.
ACOFF	I	0~5V	High Active, turn off the Adaptor power for battery automatic learning cycle
ACIN	O	0~5V	High Active, provide to EC to mean the Adaptor power is present
VS_ON	O	0~3.3V	High Active, provide toG718 when CPU OTP.
POK	I	0~3.3V	High Active, 3/5V_ALWP PGOOD signal to enable 1.1VALWP
SYSON	I	0~3.3V	High Active, EC provide this signal to enable 1.5VP
SUSP#	I	0~3.3V	High Active, EC provide this signal to enable 0.75VSP
DGPU_PWR_EN	I	0~3.3V	High Active, PCH provide this signal to enable VGA_COREP
GPU_VID0 GPU_VID1	I	0~3.3V	The VGA_CORE voltage depends on those VID
VDD_SENSE	I	0.85~0.975V	VGA_CORE Romote Sense
VGATE	O	0~3.3V	High Active, it will go high when +CPU_CORE is within SPEC.
VR_ON	I	0~3.3V	High Active, turn on/off the +CPU_COREP IC.
BATT_TEMP	O	0~5V	Analog signal, NS87570 using this voltage level to calculate battery's temperature
SMD, SMC	I/O	0~5V	SMbus communication
BATT_OVP	O	0~3.3V	Analog signal, ENE926 using this voltage level for battery over voltage protection
VIN	I/O	19V	Adapter input power
VR_SVID_DAT VR_SVID_ALRT# VR_SVID_CLK	I	0~3.3V	Control CPU_CORE output voltage.
VCCSENSE	I	0~1.35V	CPU_CORE Romote Sense

VSSSENSE			
VCC_AXG_SENSE VSS_AXG_SENSE	I	0.3~1.3V	GFX_CORE Romote Sense

4.3 Power sequence

POWER SEQUENCE
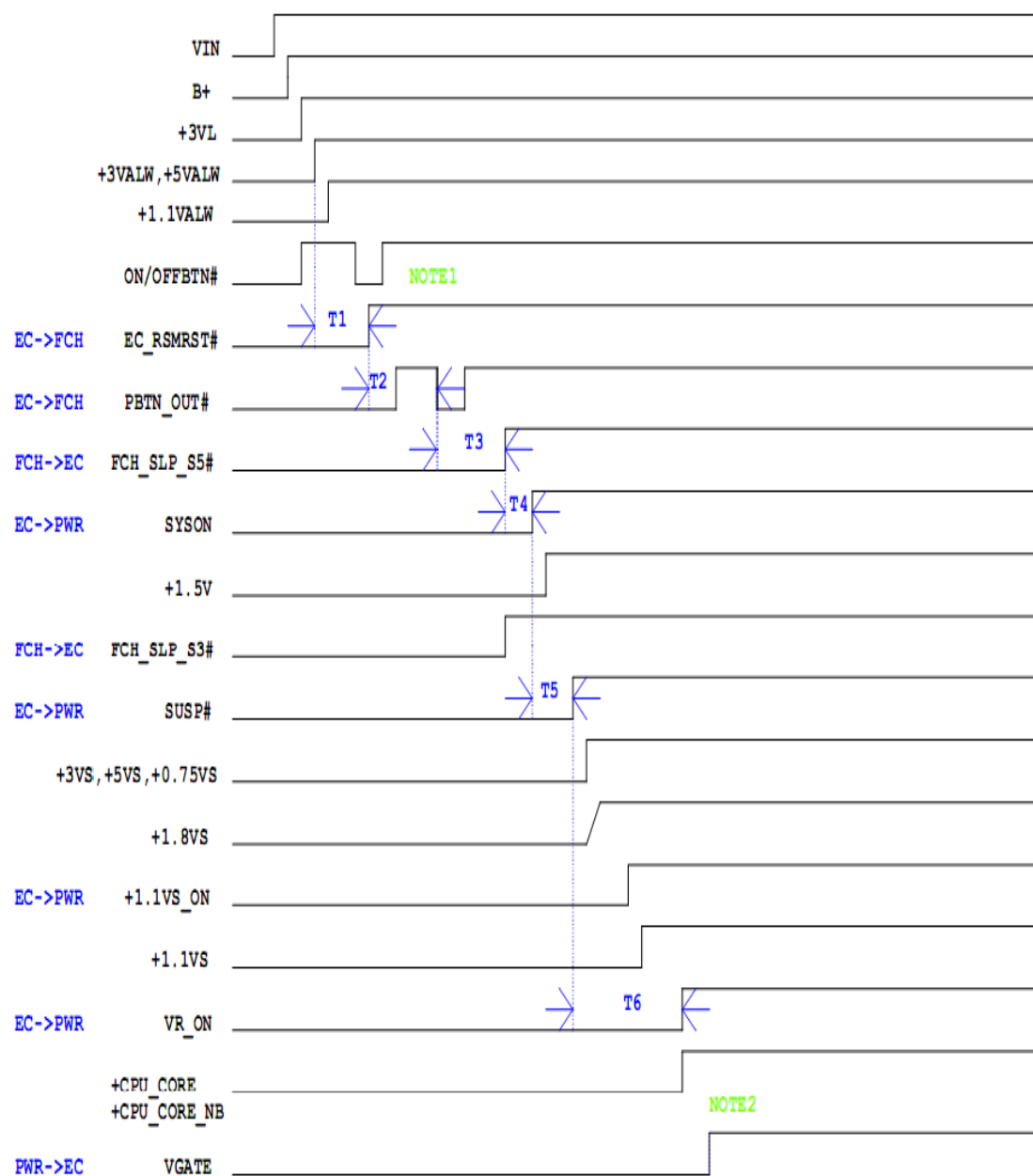
Inverter Interface

Inverter Interface			
Signal	**I/O**	**Voltage Level**	**Description**
INVPWR	power	5V	5V output for inverter
GND	power	0V/0.7A	Power system return
PWM	I	0-5V	Adjust LCD brightness by burst mode
Enable	I	0-5V	Backlight on/off control pin , active HIGH

12.1", 13.3", 14.1",and 15.1" Inverter Input connector:

CN1 : Molex 53261-0690

Pin No.	Symbol	Description
1	+5V	Input Voltage
2	+5V	Input Voltage
3	PWM	Adjust brightness
4	ENABLE	Back-light on/off control , L: OFF, H: ON
5	GND	Power system return
6	GND	Power system return

Output connector for 12.1"

CN2: JST SM02(4.0)B-BHSS-1 or JST SM03(8.0)B-BHS

Please mark "CAUTION HIGH VOLTAGE " around CN2

JST SM02(4.0)B-BHSS-1

Pin No.	Symbol	Description
1	HV	Connected to high voltage of LCD lamp
2	LV	Connected to low voltage of LCD lamp

JST SM03(8.0)B-BHS

Pin No.	Symbol	Description
1	HV	Connected to high voltage of LCD lamp
2	NC	NC
3	LV	Connected to low voltage of LCD lamp

4.4 Battery Specification

1-1. EE information

	6cell	9cell	6cell
Battery Design Capacity(mAH)	5200	7800	7200
Battery Configuration	3S2P	3S3P	3S2P
Battery Nominal Voltage(V)	11.1	11.1	11.1
Single Cell Chemistry	Li_Lion	Li_Lion	Li_Lion
Single Cell Type	18650	18650	18650
Single Cell Capacity(mAH)	2600	2600	2400
Dumb/Smart Battery	Smart Battery (SMBus ver. 1.1.)	Smart Battery (SMBus ver. 1.1.)	Smart Battery (SMBus ver. 1.1.)
Cycle Life	70% after 300cycles	70% after 300cycles	70% after 300cycles
Nominal Charging Voltage(V)	12.6	12.6	12.6
Nominal Charging Current(A)	3640	5640	5040
Protection Function	OVP UVP OTP OCP SCP RCP Cell imbalance FET-Error	OVP UVP OTP OCP SCP RCP Cell imbalance FET-Error	OVP UVP OTP OCP SCP RCP Cell imbalance FET-Error	OVP UVP OTP OCP SCP RCP Cell imbalance FET-Error

1-2. Battery Connector Pin Assignment

Pin #	Symbol	Comments
1,2	BATT+	Battery Positive Power
3	ID	Floating
4	B/I	Battery-in Function Pin*
5	SMC	SMBus clock interface I/O pin
6	SMD	SMBus data interface I/O pin
7	TS	Connect to Thermistor
8,9	GND	Common Ground Power

*: Battery cannot be charged or discharged unless this pin is connected to GND.

4.5 Adapter Specification

1. SCOPE

This specification describes the physical, functional and electrical characteristics of the 90 watts, single output +19V/4.74A, switching power supply. It would be conformed to "ENERGY STAR®" standard.

2. INPUT CHARACTERISTICS

2.1. Input Voltage

Input voltage range : 90~264Vrms.

2.2. Input Frequency

Input frequency range : 47~63 Hz

2.3. Input current

Input current should be lower than 1.5/0.8Arms under full-load and 100/240Vrms input voltage conditions.

2.4. Inrush Current

Inrush current should be less than 220A and no damage under full-load and cold start @100Vrms and 240
Vrms input voltage.

2.5. Leakage Current

The total combined leakage current shall not exceed 100 microamperes when tested at 254 Vrms, 60 Hz in a
normal operating condition.

2.6. Power Consumption

Input power saving should be lower than 0.5 Watts under No-load at 230 Vrms input voltage conditions.

2.7. Efficiency

Efficiency should be greater than 85% at full load @input voltage 115/230Vrms

3. OUTPUT CHARACTERISTICS

3.1. Output Characteristics

Output voltage, load current, voltage regulation and output noise of power supply should meet the
specifications, which defined on the tables below:

Table 1 ： Electrical Characteristics overview
Item Performance Remarks
Output Voltage Rating 19Vdc
Output Range 18.5V~20V
Full Load 4.74A
Min. Load 0.0A
Peak Load 6.3A Vo regulation:18V~20V / 5minutes @115Vac, 230Vac
input, Cold start ,ambient=25℃.
Max. Ripple Voltage 300mVp-p Note 1
Line Regulation ±1%
Load Regulation 18.5V~20V
Dynamic Load 18.5V~20V Note 2
Hold up Time 5 mS Min. Full Load & 115Vac /60Hz input, Phase 90 degree.
Vo:18.5Vdcmin.@ambient=25℃ Note 3
Turn on Time 3 S Max. Full Load & 115Vac /60Hz input
(Operating Temp.:5°C to 40°C) Note 3
Rise time 30mS Max.
Overshoot 20V

3.2. Protection :

3.2.1. Short Circuit Protection : The power supply shall shutdown and
no damage for output shorting.
The output will recover automatically when the short is removed.

3.2.2. Over Voltage Protection : The Power supply shall shutdown for
any cause of over voltage condition before output voltage reached 29V .The Power
supply is latched and power on reset is required.

3.2.3. Over Temperature Protection : No deformation and no
discoloration on case and will be shutdown.
That might return to normal state by AC reset.

Chapter 5
Disassembly Guide

1. Disassembling the Base Unit

These are the directions for disassembling the base unit. You will need a 5.5mm Nut Driver, a medium size Philips screwdriver.

These directions are to disassemble the complete unit and are cross-referenced to Chapter 7 for the replacement of component parts.

Before disassembly, make sure the notebook is powered off.

1.1 upper and lower disassemble

1.1.1 Disassemble battery 、thermal door and HDD door; (take off 7 pcs screw) follow the steps below:

Turn the notebook upside down.

Slide the battery lock to unlock the battery pack.

Slide the battery release latch in the direction of the arrow; gently pry the battery pack from its housing.

NOTE: Always start laptop disassembly by removing the battery pack first.

Follow the steps below to remove the thermal door:

Turn the notebook upside down.

Remove the 1 screws securing the bottom cover.

1.1.2 Take off ODD screw ;(take off 1pcs screw) Disassemble ODD and HDD module

1.1.3 Take off Fun and Thermal module(first take off 5 pcs screw, pull out fan CONN, then take

out fan and thermal)

1.1.4 Disassemble W/L card ;(first pull out RF connector, then take off 1pcs screw, and take out

W/L card)

1.1.5 Disassemble RAM;

1.1.6 Disassemble CPU;

1.1.7 Take off 13 screw on lower as below:

1.1.8 take the computer stand up and take off two screws;

1.1.9 turn over computer and open LCD ,disassembled K/B（tool：pick 'two pin assembler golden tape'）.

1.1.10 Disassemble Keyboard

1.1.11 Open up power/B 、speaker cable connector、T/P FFC & MIC cable connector , remove

power/B and speaker;(take off 3 pcs screw)

1.1.12 Disassemble upper ;

open upper from left corner,and bring up upper

then ahead to right ,lift up upper left & right corner ,shake it and take off upper

1.1.13 Disassemble LVDS CONN & MIC CONN ;and W/L card

pick up LVDS conn tape ,and push conn to right ,take off LVDS conn

1.1.14 Disassemble Hinge Cap at lower screw（two screws）, take off LCD.

1.1.15 Disassemble M/B&USB/B at lower screws（3 screws）,and take off M/B&USB/B.
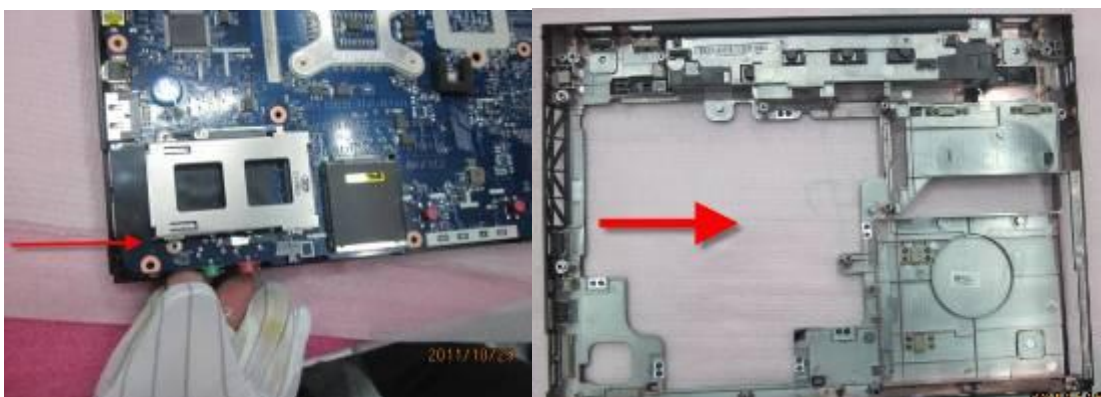
1.2 LCD Part

1.2.1 Disassemble LCD bezel;(take off 2 pcs screw)

open left&right bezel follow arrow ,and attention LCD latch can't hook bezel,take off bezel

1.2.2 Disassemble panel(take off 4 screws)，take off panel CONN

1.2.3 Disassemble hinge （4 screws）, and take off hinge cap（2 screws）

take off two hinge cap

1.2.4 Disassemble W/L &camera &MIC FFC

1.first take off five sponge

2.take off camera cable and camera

3.take off W/L cable & 3G cable &MIC cable

4.cover

1.3 Upper disassemble

1.3.1 take off T/P bracket, finger printer , Speaker& Power/B screw（7 screws）
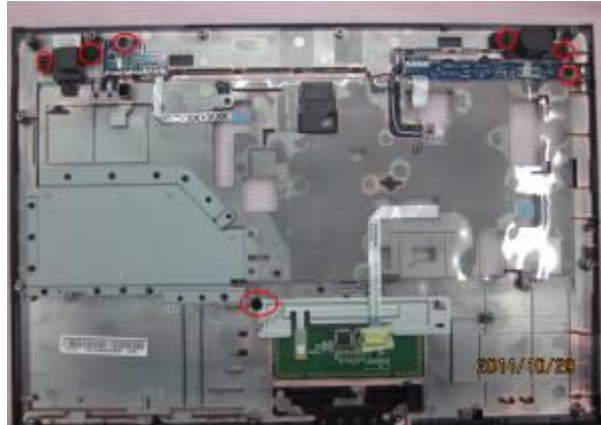
1.3.2 take off T/P bracket, speaker cable，finger printer&power/board
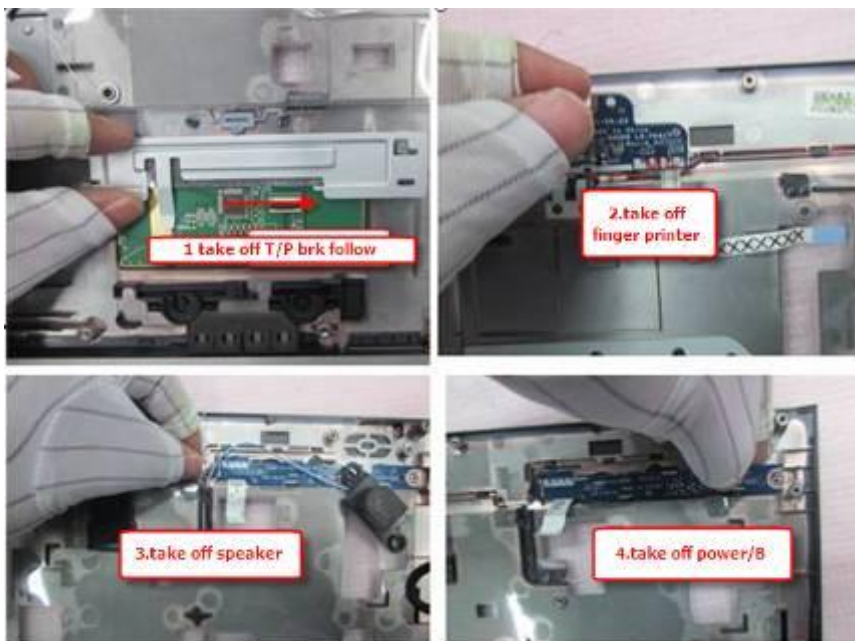
1.4 HDD ODD module disassemble

1.4.1 HDD disassemble (Remove 4 screws as below photo)

1.4.2 ODD disassemble

take off 2 screws and bracket,and then take off ODD

Chapter6 Testing and Troubleshooting

1. Testing and Troubleshooting

The purpose of this chapter is to provide a systematic method of isolating problems you may have with the PCM10 series Notebook Computer. We assume that you have a basic understanding of DOS-based computer systems as well as knowledge of standard troubleshooting procedures. This manual is written under the assumption that the problems are indeed related with Notebook itself. The improper usage and application software problems are excluded in this chapter. The system BIOS Beep Code is an integrated unit to detect some errors in the system board. This beep code will give immediate identification of certain system board problems. If the troubleshooting procedure is followed step by step, it can efficiently isolate the problem and the problem can be solved easily.

1.1 PERFORM VISUAL INSPECTION

Check the following:

- Power cords are properly connected and secured
- Power supply is adequate for operation
- There are no obvious shorts or opens
- There are no obviously burned or heated components
- All components appear normal

1.2 Troubleshooting Flowchart

Use the flowchart in Figure 6-1 as a guide for determining which troubleshooting procedures to execute. Before going through the flowchart steps, verify the following:

- Ask the user if a password is registered and, if it is, ask him or her to enter the password.
- Verify with the customer that Win7 is installed on the hard disk. Operating systems that were not preinstalled by Compal can cause the computer to malfunction.
- Make sure all optional equipment is removed from the computer.
- Make sure the floppy disk drive is empty.

Figure 6-1 Troubleshooting flowchart (1/2)

Chapter 6

```
                                    ┌─────┐
                                    │  A  │
                                    └─────┘
                                      Yes
                                       │
                                       ▼
   ◇ Does typed characters appear correctly? ◇ ──No──▶  ┌──────────────────────────┐
                                                        │ Perform the keyboard     │
                                       │                │ Troubleshooting procedures│
                                      Yes               │ in section 6-5           │
                                       │                └──────────────────────────┘
                                       ▼
   ┌───────────────────────────────────────┐
   │ Insert the diagnostics disk into FDD. │
   │ Then run the diagnostics test program.│
   └───────────────────────────────────────┘
                                      Yes
                                       │
                                       ▼
   ◇   Is the diagnostics test loaded?   ◇ ──No──▶  ┌──────────────────────────┐
                                                    │ Perform the FDD          │
                                       │            │ Troubleshooting procedures│
                                      Yes           │ in section 6-4           │
                                       │            └──────────────────────────┘
                                       ▼
   ┌───────────────────────────────────────┐
   │ Allow each test to perform            │
   │ automatically                         │
   └───────────────────────────────────────┘
                                       │
                                       ▼
   ◇  Is an error detected by any of the  ◇ ──Yes──▶ ┌──────────────────────────┐
   ◇         diagnostics tests?           ◇          │ After confirming which   │
                                                     │ diagnostics test has detected│
                                       │             │ an error, perform the    │
                                      No             │ appropriate procedure as │
                                       │             │ outlined below.          │
                                       ▼             └──────────────────────────┘
   ┌───────────────────────────────────────┐
   │ System is normal                      │
   └───────────────────────────────────────┘
                                       │
                                       ▼
                                    ( End )
```

Figure 6-1 Troubleshooting flowchart (2/2)

If the diagnostics program cannot detect an error, the problem may be intermittent. The test program should be executed several times to isolate the problem. When a problem has been located, perform the appropriate troubleshooting procedures as follows:

- If an error is detected by the main battery test, perform the Power Supply Troubleshooting procedures in Section 6-2.
- If an error is detected by the display test, perform the Display Troubleshooting procedures in Section 6-3.
  - If an error is detected by the keyboard test, perform the Keyboard Troubleshooting procedures in Section 6-4.
  - If an error is detected when using an external USB device, perform the External USB Devices

Troubleshooting procedures in Section 6-5.

- If an error is detected when using the CRT connection, perform the CRT Failure Troubleshooting procedures in Section 6-6.
- If an error is detected when using the HDMI connection, perform the HDMI Failure Troubleshooting procedures in Section 6-7.
- If an error is detected when using the touch pad, perform the Touch Pad Troubleshooting procedures in Section 6-8.
- If an error is detected when using the speakers, perform the Speaker Troubleshooting procedures in Section 6-9.
- If an error is detected when using the CD/DVD drive, perform the CD-ROM/DVD Drive Troubleshooting procedures in Section 6-10.
- If an error is detected when using the Wireless LAN unit, perform the Wireless LAN Troubleshooting procedures in Section 6-11.
- If an error is detected when using the Camera, perform the Camera Troubleshooting procedures in Section 6-12.
- If an error is detected when using the Bluetooth, perform the Bluetooth Troubleshooting procedures in Section 6-13.

2. Power Supply Troubleshooting

```
                    ┌──────────────┐
                    │    START     │
                    └──────┬───────┘
                           │
              ┌────────────▼────────────┐
              │  Check Power Supply     │
              │  Status (Procedure 1)   │
              └────────────┬────────────┘
                           │
                    ╱──────────────╲                ┌─────────────────────────┐
                   ╱ Are the DC-IN and ╲    No       │ Replace adaptor / battery│
                  ╱  Battery LEDs lit?   ╲──────────▶│     (Procedure 2)       │
                   ╲                    ╱            └─────────────────────────┘
                    ╲──────────────╱
                           │ Yes
              ┌────────────▼────────────┐
              │  Check power supply     │
              │  connections            │
              │  (Procedure 3)          │
              └────────────┬────────────┘
                           │
                    ╱──────────────╲                ┌─────────────────────────┐
                   ╱ Can you turn the ╲   Yes        │ Run diagnostic program  │
                  ╱   computer on?     ╲───────────▶ │     (Procedure 4)       │
                   ╲                  ╱              └─────────────────────────┘
                    ╲──────────────╱
                           │ No
                    ╱──────────────╲                ┌─────────────────────────┐
                   ╱ Are the internal ╲   No         │ Perform internal        │
                  ╱  power connections  ╲──────────▶ │ connection check        │
                   ╲   secure?         ╱             │     (Procedure 5)       │
                    ╲──────────────╱                 └─────────────────────────┘
                           │ Yes
              ┌────────────▼────────────┐
              │  Replace system board   │
              └────────────┬────────────┘
                           │
                    ┌──────▼───────┐
                    │     END      │
                    └──────────────┘
```
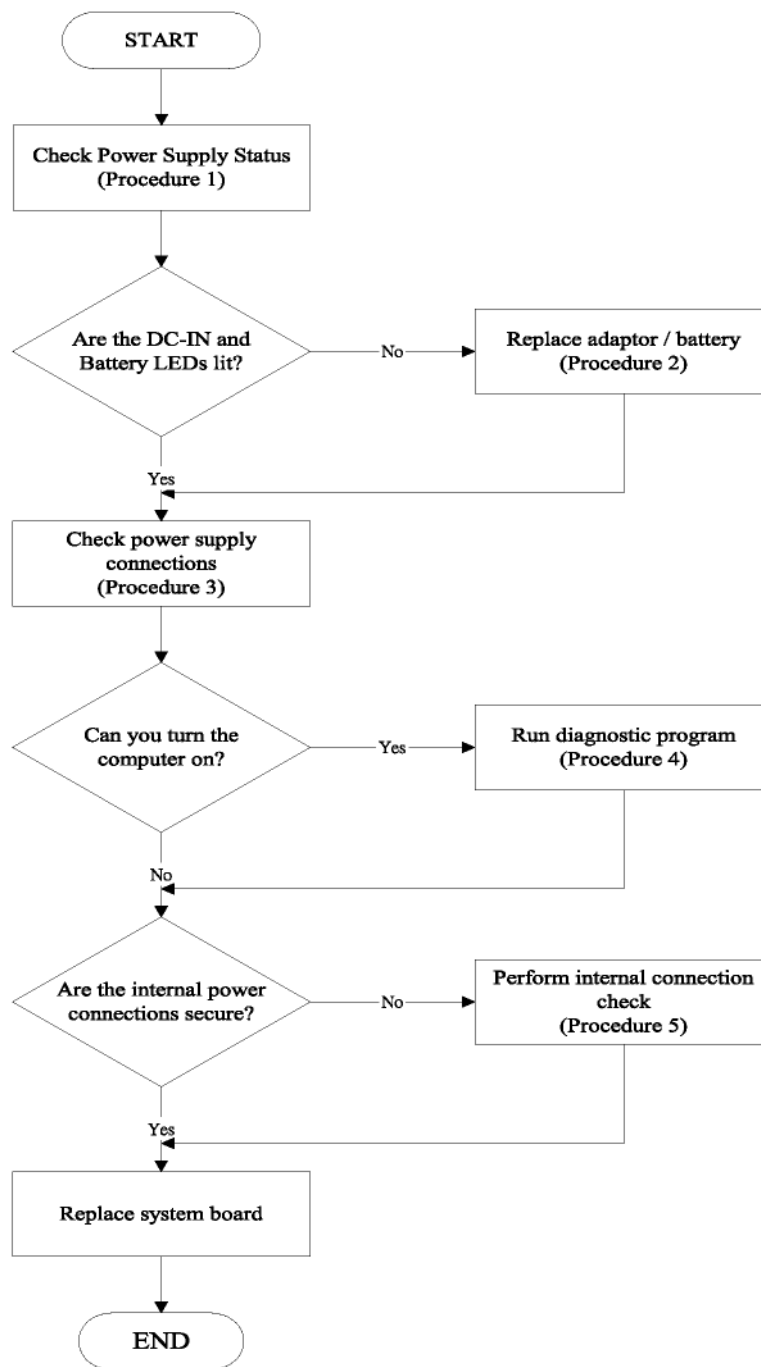
Figure 6-2 Power Supply Troubleshooting Process

The power supply controls many functions and components. To determine if the power supply is functioning properly, start with Procedure 1 and continue with the other Procedures as instructed. The flowchart in Figure 6-2 gives a summary of the process.

The procedures described in this section are:

- Procedure 1:   Power status check
- Procedure 2:   Adaptor / battery replacement
- Procedure 3:   Power supply connection check
- Procedure 4:   Diagnostic check
- Procedure 5:   Internal connection check

Procedure 1   Power Status Check

The following LEDs indicate the power supply status:

Battery LED

The power supply controller displays the power supply status through the Battery and the POWER LEDs as listed in the tables below.

- Table 2-1 Battery LED

Battery State	LED colors	Definition
Charging	Amber, solid on	Battery charging with AC
	blue, solid on	Battery fully charged by AC
	color off	Battery abnormal: stop charging with AC (Bad cell/ Overheated)
Discharging	Amber, blinking (1 second on/1second off)	Battery within low state The system is protected and cannot be re-powered on without the AC power connected.
	Amber & Blue, blinking (Flash 500ms on/500ms off)	Battery error
	Color off	Battery not in low or critical low state; in discharging state

- Table 2-2 POWER LED

Power supply status	POWER LED
System Power On (Power button LED is solid white, Power LED is solid blue).	White Solid on Blue Solid on
System Suspended	White blinking Blue blinking
System Power Off.	Off

To check the power supply status, install a battery pack and connect an AC adaptor to the DC-IN port on the computer and to a power supply.

If the Battery LED is not lit, go to Procedure 2

Chapter 6

Procedure 2   Adaptor / battery replacement

A faulty adaptor may not supply power or may not charge the battery.

Perform Check 1.

Check 1   Connect a new AC adaptor. If the problem is not resolved, go to Check 2.

Check 2   Insert a new battery. If the problem is still not resolved, go to Procedure 3.

Procedure 3   Power supply connection check

The power supply wiring diagram is shown below:
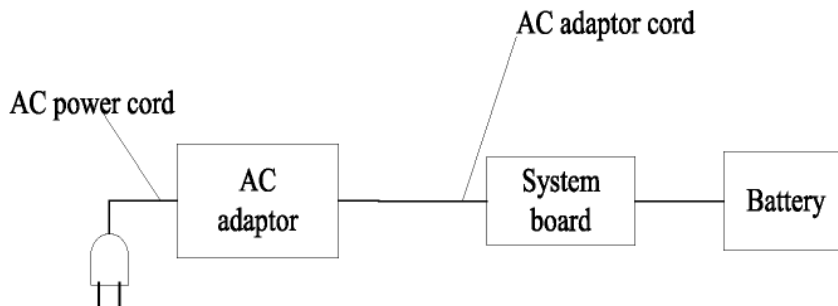
Any of the connectors may be disconnected. Perform Check 1.

Check 1
Disconnect the AC power cord from wall outlet. Check the power cable for breaks.
- If the power cord is damaged, connect a new AC power cord.
- If there is no damage, go to Check 2.

Check 2
Make sure the AC adaptor cord and AC power cord are firmly plugged into the DC-IN socket, AC adaptor inlet and wall outlet.
- If these cables are connected correctly, go to Check 3.

Check 3
Make sure that the DC-IN input port socket is firmly secured to the system board of the computer.
- If the DC-IN input socket is loose, go to Procedure 5.
- If it is not loose, go to Check 4.

Check 4
Use a millimeter to make sure that the AC adaptor output voltage is close to 19 V.
- If the output is several percent lower than 19 V, go to Check 5.
- If the output is close to 19 V, go to Check 6.

Check 5

Connect a new AC adaptor or AC power cord.

  ◆ If the battery LED does not light, go to Check 6.

Check 6

Make sure the battery pack is installed in the computer correctly.

  ◆ If the battery is properly installed and the battery LED still does not light, go to Procedure 4.

Procedure 4　　Diagnostic check

The power supply may not charge the battery pack. Perform the following procedures:

  ◆ Reinstall the battery pack.

  ◆ Attach the AC adaptor and turn on the power. If you cannot turn on the power, go to Procedure 5.

  ◆ Run the Diagnostic test following the procedures described Tests and Diagnostics. If no problem is detected, the battery is functioning normally.

Procedure 5　　Replacement check

The system board may be disconnected or damaged. Disassemble the computer following the steps described *Replacement Procedures.* Check the connection between the AC adaptor and the system board. After checking the connection, perform Check 1:

Check 1

Use a millimeter to make sure that the fuses on the system board are not blown.

  ◆ If a fuse is not blown, go to Check 2.

  ◆ If a fuse is blown, go to Check 3.

Check 2

Make sure that the battery cable is firmly connected to the system board.

  ◆ If it is connected firmly, go to Check 3.

Check 3

The system board may be damaged. Replace it with a new one following the instructions in Chapter 4.
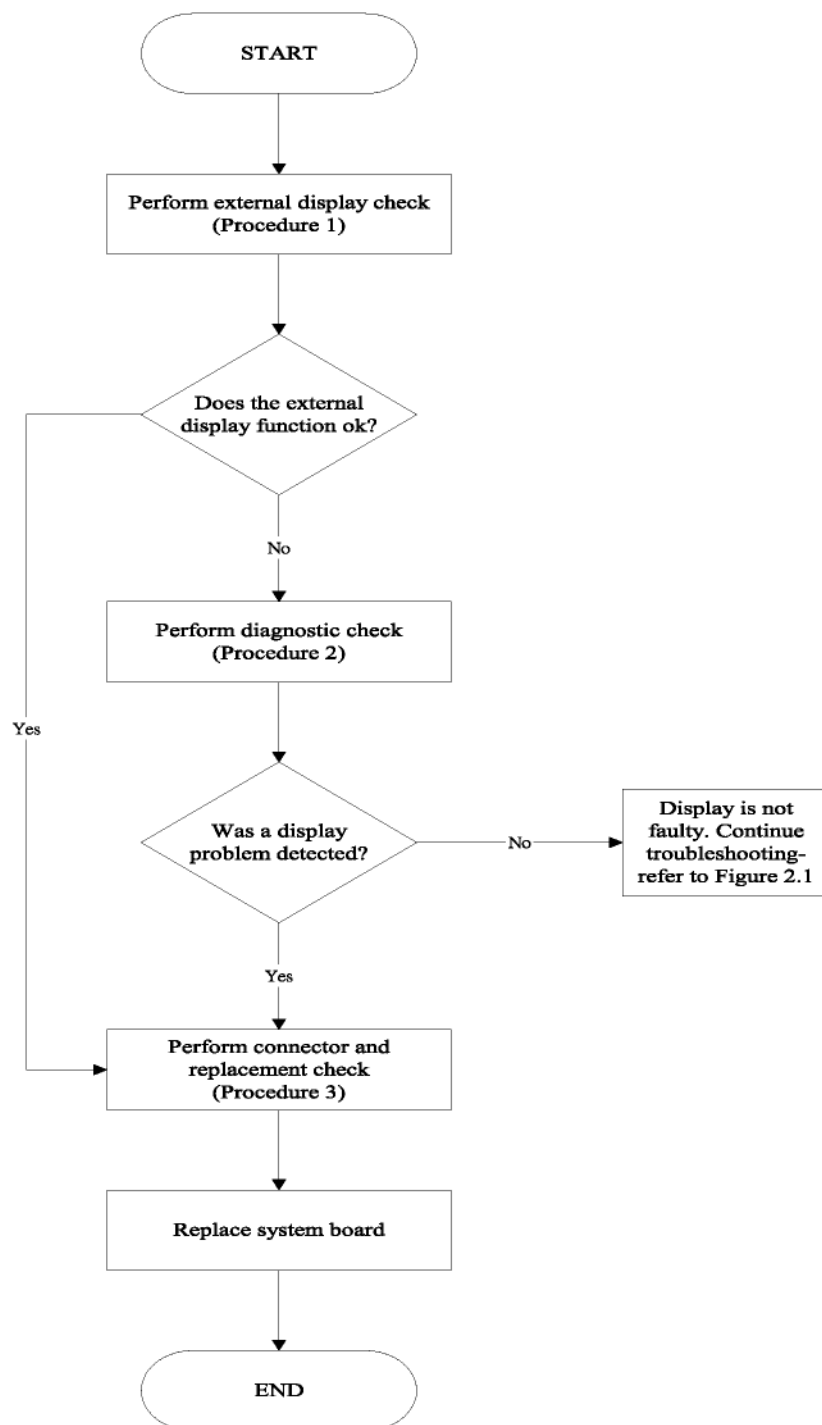
Chapter 6

Display Troubleshooting

Figure 6-3 Display troubleshooting process

This section describes how to determine if the computer's display is functioning properly. The process is outlined in Figure 6-3. Start with Procedure 1 and continue with the other procedures as instructed.

- ◆ Procedure 1:   External display check
- ◆ Procedure 2:   Diagnostic check
- ◆ Procedure 3:   Connector and replacement check

Procedure 1   External display check

Connect an external display to the computer's external monitor port, then boot the computer. The computer automatically detects the external display. Press Fn+F3 to switch to the external display.

If the external display works correctly, the internal LCD may be damaged. Go to Procedure 3.

If the external monitor appears to have the same problem as the internal monitor, the system board may be damaged. Go to Procedure 2.

Procedure 2   Diagnostic check

The Display Test program is stored on the computer's Diagnostics disk. This program checks the display controller on the system board. Insert the Diagnostics disk in the computer's floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics* for details.

If an error is detected, go to Procedure 3. If an error is not detected, the display is functioning properly.

Procedure 3   Connector and replacement check

The FL inverter board, LCD module, and system board are connected to the display circuits. Any of these components may be damaged. *Replacement Procedures,* for instructions on how to disassemble the computer and then perform the following checks:

Check 1

Make sure the DDRRAM module is seated properly. Test display again.

- ◆ If the problem still exits, replace the DDRRAM module.

- ◆ If the problem still exists, perform check 2.

Check 2

Replace the FL inverter board with a new one and test display again.

- ◆ If the problem still exists, perform Check 3.

Check 3

Replace the LCD module with a new one and test display again.

- ◆ If the problem still exists, perform Check 4.

Check 4

Replace the LCD/FL cable with a new one and test display again.

- ◆ If the problem still exists, perform Check 5.

Check 5

Replace the CPU with another of the same specifications.

- ◆ If the problem still exists, perform Check 6.

Check 6

The system board may be damaged. Replace it with a new one.

Chapter 6

Keyboard Troubleshooting


```
                        ┌─────────────┐
                        │    START    │
                        └─────────────┘
                               │
                               ▼
                 ┌──────────────────────────────┐
                 │ Perform external keyboard check│
                 │        (Procedure 1)           │
                 └──────────────────────────────┘
                               │
                               ▼
                        ╱───────────╲
                       ╱ Does the    ╲
          No ◄────────╱ external      ╲
          │           ╲ keyboard       ╱
          │            ╲ function ok?  ╱
          │             ╲────────────╱
          │                  │ Yes
          │                  ▼
          │     ┌──────────────────────────┐
          │     │ Perform diagnostic check │
          │     │      (Procedure 2)       │
          │     └──────────────────────────┘
          │                  │
          │                  ▼
          │           ╱──────────╲         ┌────────────────────┐
          │          ╱ Was a      ╲   No   │ Keyboard is not    │
          │         ╱  keyboard     ╲─────►│ faulty. Continue   │
          │         ╲  problem       ╱      │ troubleshooting-   │
          │          ╲ detected?    ╱       │ refer to Figure 2.1│
          │           ╲────────────╱        └────────────────────┘
          │                  │ Yes
          │                  ▼
          │     ┌──────────────────────────┐
          └────►│ Perform connector and     │
                │ replacement check         │
                │      (Procedure 3)        │
                └──────────────────────────┘
                               │
                               ▼
                 ┌──────────────────────────┐
                 │   Replace system board   │
                 └──────────────────────────┘
                               │
                               ▼
                        ┌─────────────┐
                        │     END     │
                        └─────────────┘
```
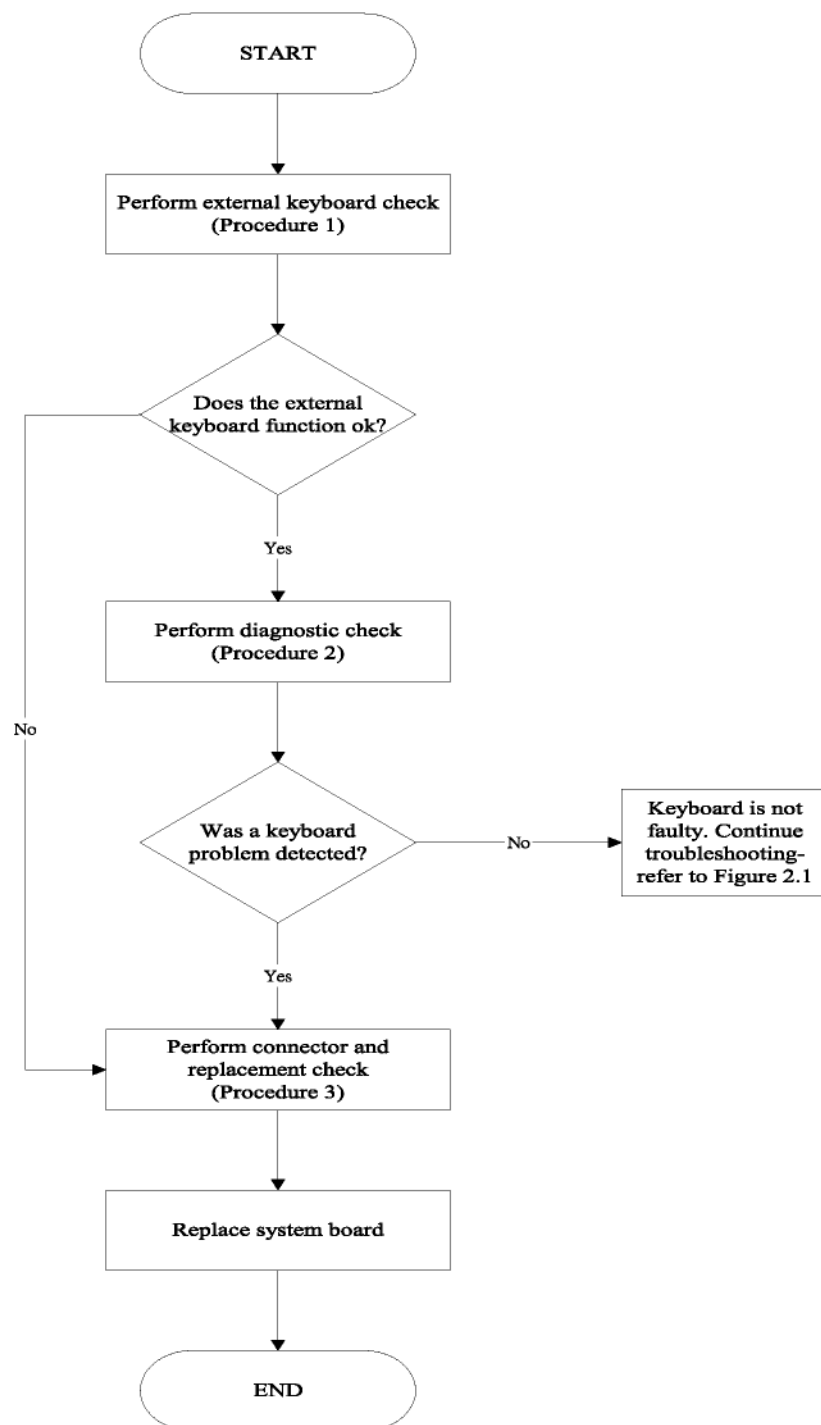
Figure 6-4 Keyboard troubleshooting process

To determine if the computer's keyboard is functioning properly, perform the following procedures. Figure 6-5 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

- ◆ Procedure 1:   External keyboard check
- ◆ Procedure 2:   Diagnostic check
- ◆ Procedure 3:   Connector and replacement check

Procedure 1   External keyboard check

Connect a USB keyboard to one of the computer's keyboard/mouse ports, then boot the computer. The computer automatically detects the external keyboard.

If the external keyboard works correctly, the internal keyboard or its connections may be faulty. Go to Procedure 2.

If the external keyboard appears to have the same problem as the internal keyboard, the system board may be damaged.

Procedure 2   Diagnostic test

Run the Diagnostic Program, which will automatically execute the Keyboard Test. Refer to Chapter 3, Tests and Diagnostics for more information on how to run the program.

If an error is located, go to Procedure 3. If an error does not occur, the keyboard is functioning properly.

Procedure 3   Connector and replacement check

The keyboard and/or system board may be disconnected or damaged. *Replacement Procedures* and perform the following checks.

Check 1

Make sure the keyboard cable is firmly connected to the system board.

- ◆ If the connection is loose, reconnect firmly and repeat Procedure 2.
- ◆ If there is still an error, go to Check 2.

Check 2

The keyboard may be damaged.

- ◆ If the problem still exists, perform Check 3.

Check 3

The system board may be damaged. Replace it with a new one.
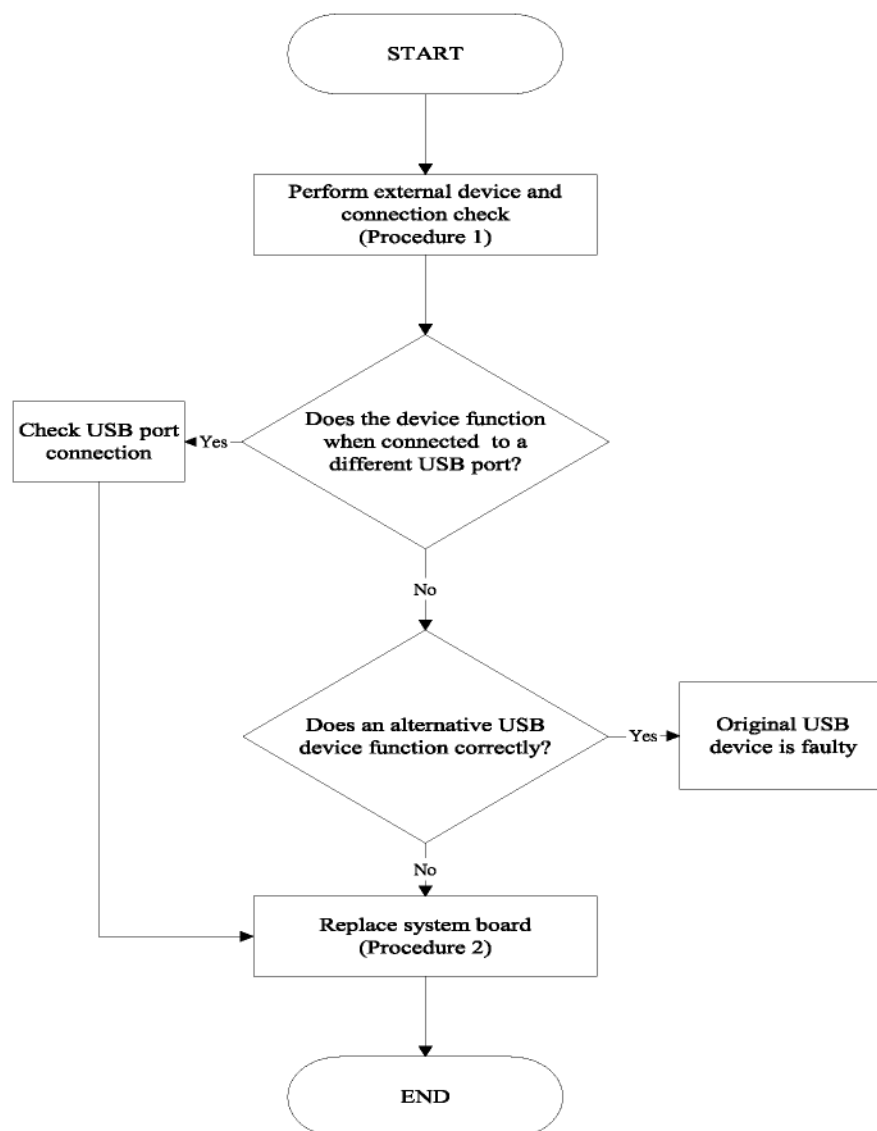
External USB Devices Troubleshooting

Figure 6-5 External USB device troubleshooting process

To determine if the computer's external USB devices are functioning properly, perform the following procedures. Figure 6-5 outlines the process. Start with Procedure 1 and continue as instructed.

- ◆ Procedure 1: External device and connection check
- ◆ Procedure 2: Replace system board

Procedure 1　　External device and connection check

The USB device may be damaged or the connection may be faulty. Perform Check 1.

Check 1

Make sure USB device cable is firmly plugged into one of the USB sockets.

- ◆ If the cable is connected correctly, go to Check 2.

Check 2

Plug the USB device into another USB socket (there are three in all).

- ◆ If the USB device still does not work, go to Check 4.
- ◆ If the device functions correctly when connected to another USB port, go to Check 3

Check 3

Make sure that the USB socket is firmly secured to the system board of the computer.

- ◆ If the malfunction remains, the system board may be damaged. Go to Procedure 2.

Check 4

Connect an alternative USB device to one of the computer's USB ports, and then boot the computer. The computer automatically detects the external device.

- ◆ If the alternative USB device works correctly, the original device may be damaged and should be replaced.
- ◆ If the alternative USB device appears to have the same problem as the original device, the system board may be damaged. Go to Procedure 2.

Procedure 2　　Replace system board

If the error persists, the system board may be damaged.

CRT troubleshooting

Figure 6-6 CRT troubleshooting process

To determine if the computer's CRT port is functioning properly, perform the following procedures. Figure 6-6 outlines the process. Start with Procedure 1 and continue as instructed.

- ◆ Procedure 1: CRT connection check
- ◆ Procedure 2: CRT set check

Procedure 1 CRT connection check

The CRT cable may be damaged or the connections may be loose. Perform Check 1:

Check 1

Make sure CRT cable is firmly plugged into both the CRT set and the CRT port of the computer.

- ◆ If the cable is connected correctly, go to Check 2.

Check 2

Make sure the CRT port is firmly secured to the system board of the computer.

- ◆ If the malfunction remains, go to Check 3.

Check 3

The CRT cable may be damaged. Replace with a good cable.

- ◆ If the malfunction remains, go to Procedure 2

Procedure 2 CRT set check

The CRT set may be faulty. Perform Check 1

Check 1

Try using the set for CRT reception.

- ◆ If it does not work, the set may be damaged.
- ◆ If the set does work, perform Check 2.

Check 2

Try connecting a different CRT to the computer.

- ◆ If the replacement television works, the original set may be damaged.
- ◆ If the replacement set does not work the system board may be damaged.

Chapter 6

HDMI troubleshooting

```
                    ┌──────────┐
                    │  START   │
                    └────┬─────┘
                         │
        ┌────────────────▼────────────────┐
        │  Perform HDMI connection check  │
        │          (procedure 1)          │
        └────────────────┬────────────────┘
                         │ yes
                         ▼
              ╱ Does replace HDMI ╲                    ┌──────────────┐
             ╱  cable fuction      ╲ ──── No ────────▶ │ replace HDMI │
             ╲   property?         ╱                   │    cable     │
              ╲_____╱                    └──────────────┘
                         │ yes
                         ▼
        ┌────────────────────────────────┐
        │    Perform HDMI set check      │
        │        (Precedure 2)           │
        └────────────────┬───────────────┘
                         │ yes
                         ▼
              ╱ HDMI fuctioning ╲                      ┌───────────────────┐
             ╱      Ok?          ╲ ──── No ──────────▶ │ Use different HDMI │
             ╲                   ╱                     │        set         │
              ╲_____╱                      └───────────────────┘
                         │ yes
                         ▼
        ┌────────────────────────────────┐
        │      replace system board      │
        └────────────────┬───────────────┘
                         ▼
                    ┌──────────┐
                    │   NED    │
                    └──────────┘
```
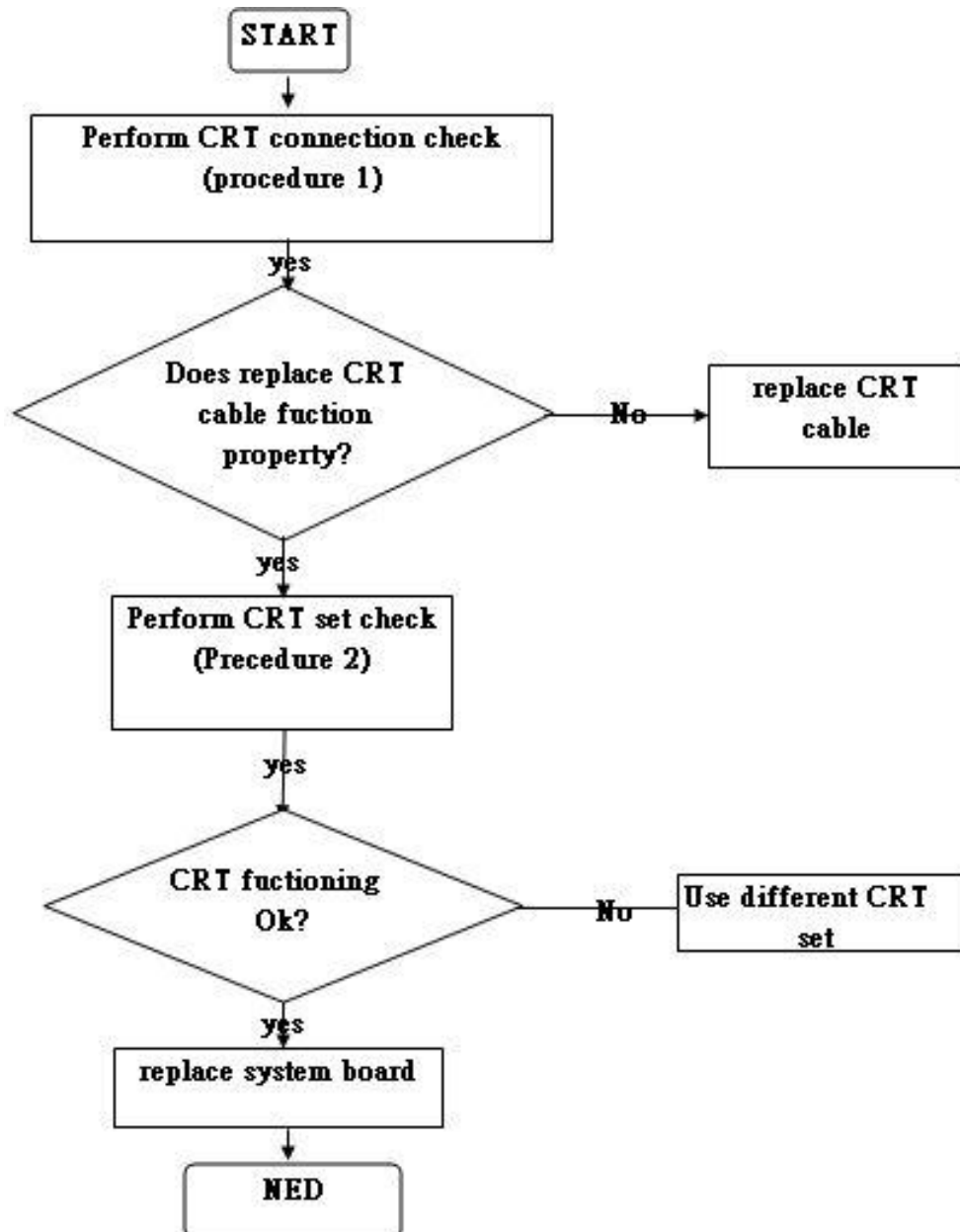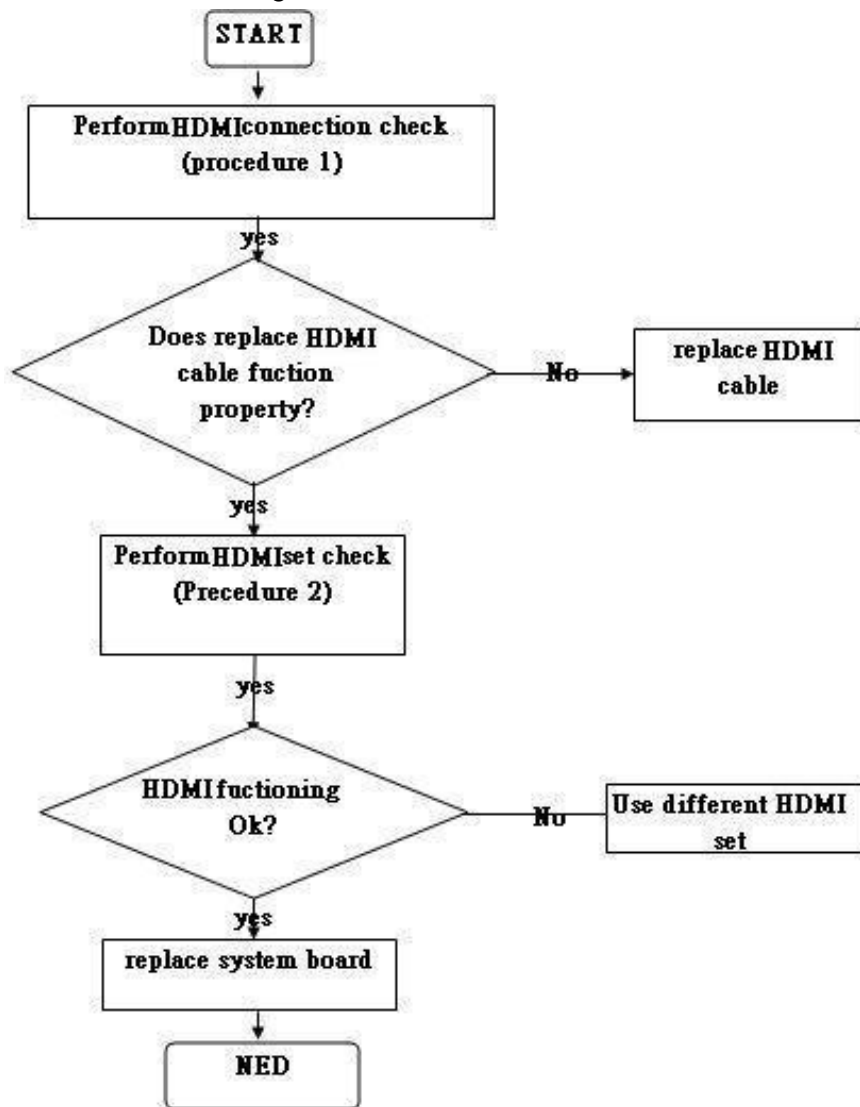
Figure 6-7 HDMI troubleshooting process

To determine if the computer's HDMI port is functioning properly, perform the following procedures. Figure 6-7 outlines the process. Start with Procedure 1 and continue as instructed.

 ◆ Procedure 1:   HDMI connection check

 ◆ Procedure 2:   HDMI set check

Procedure 1   HDMI connection check

The HDMI cable may be damaged or the connections may be loose. Perform Check 1:

Check 1

Make sure HDMI cable is firmly plugged into both the HDMI set and the HDMI port of the computer.

 ◆ If the cable is connected correctly, go to Check 2.

Check 2

Make sure the HDMI port is firmly secured to the system board of the computer.

 ◆ If the malfunction remains, go to Check 3.

Check 3

The HDMI cable may be damaged. Replace with a good cable.

 ◆ If the malfunction remains, go to Procedure 2

Procedure 2   HDMI set check

The HDMI set may be faulty. Perform Check 1

Check 1

Try using the set for HDMI reception.

 ◆ If it does not work, the set may be damaged.

 ◆ If the set does work, perform Check 2.

Check 2

Try connecting a different HDMI to the computer.

 ◆ If the replacement television works, the original set may be damaged.

 ◆ If the replacement set does not work the system board may be damaged.
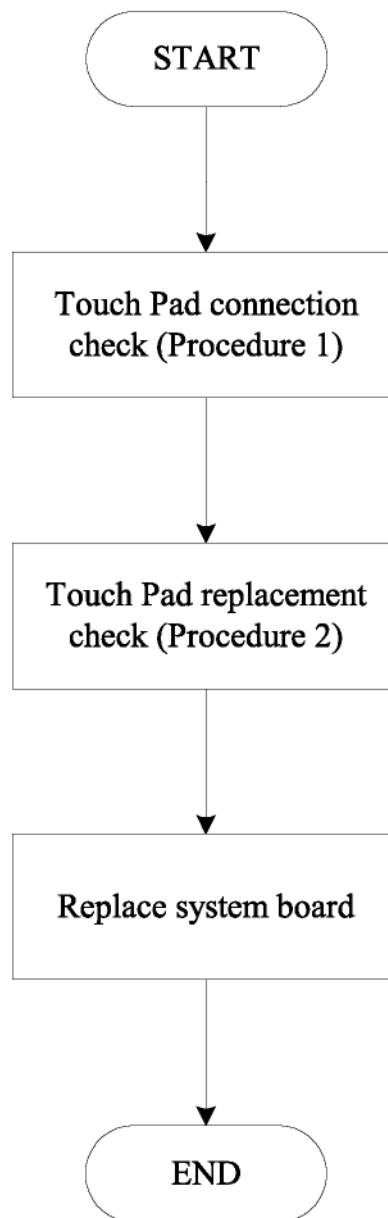
Chapter 6

Touch Pad Troubleshooting

Figure 6-8 Touch Pad troubleshooting process

To determine if the computer's built-in Touch Pad is functioning properly, perform the following procedures. Figure 6-8 outlines the process. Start with Procedure 1 and continue as instructed.

- ◆ Procedure 1:   Touch Pad connection check
- ◆ Procedure 2:   Touch Pad replacement check

Procedure 1   Touch Pad connection check

The Touch Pad is connected by the Touch Pad FPC to the system board. Make sure the Touch Pad FPC cable is firmly connected to the Touch Pad and system board. Replacement Procedures for instructions on how to disassemble the computer and then perform the following checks.

If any of the connections are loose, reconnect firmly. If any of the connections is damaged, or there is still an error, go to Procedure 2.

Procedure 2   Touch Pad replacement check

The Touch Pad unit or FPC may be defective or damaged.
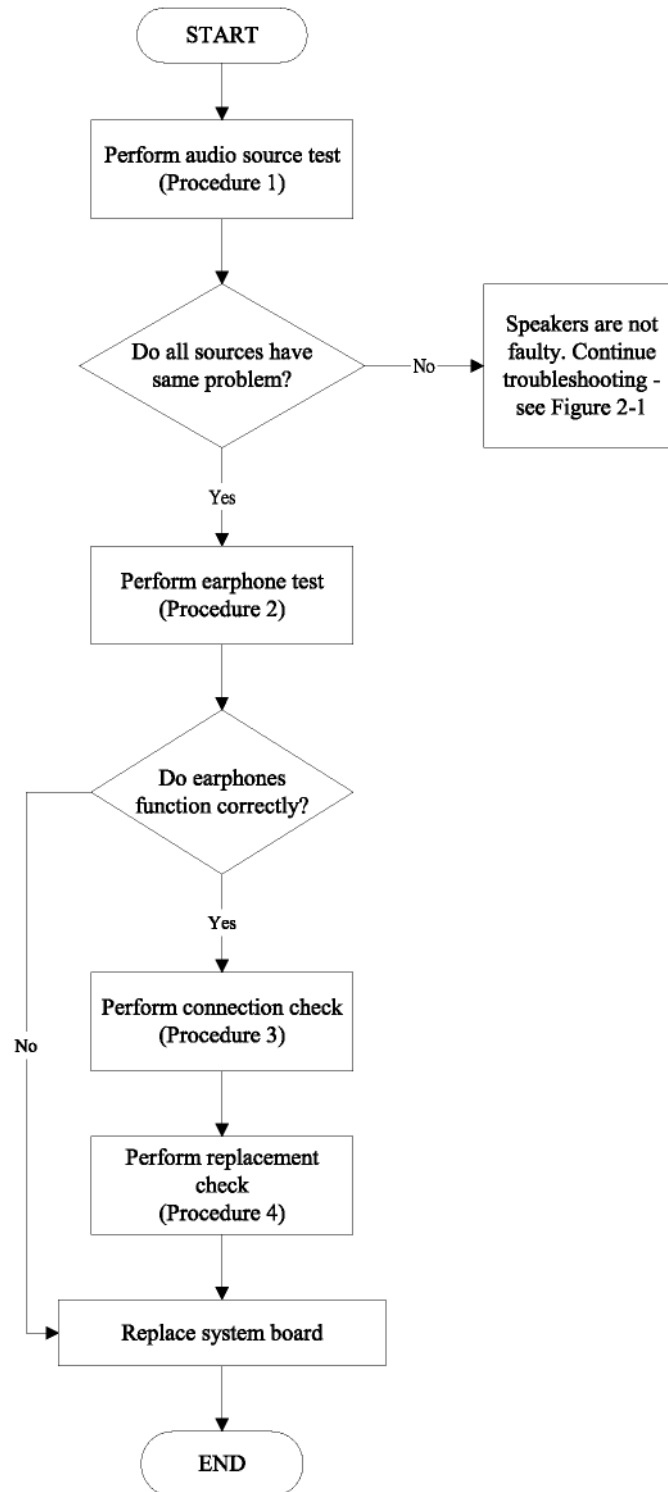
Chapter 6

Speaker Troubleshooting

Figure 6-9 Speaker troubleshooting process

To determine if the computer's built-in speakers are functioning properly, perform the following procedures. Figure 6-9 outlines the process. First adjust the speaker volume to an appropriate level. Start with Procedure 1 and continue as instructed.

- ◆ Procedure 1:   Audio source test
- ◆ Procedure 2:   Earphone test
- ◆ Procedure 3:   Connection check
- ◆ Procedure 4:   Replacement check

Procedure 1   Audio source test

Try different audio sources (e.g. an audio CD and digital music file) to determine whether the fault is in the speaker system or not. If not all sources have sound problems, the problem is in the source devices. If all have the same problem, continue with Procedure 2.

Procedure 2   Earphone test

Connect a set if earphones or external speakers. If these function correctly, go to Procedure 3. If they do not function correctly, the system board may be defective or damaged. Replace it with a new one.

Procedure 3   Connection check

Disassemble the computer following the steps described *Replacement Procedures* and make sure the speaker cable is firmly connected to the system board. If the stereo speakers are still not functioning properly, go to Procedure 4.

Procedure 4   Replacement Check

If the stereo speakers don't sound properly, the stereo speakers may be defective or damaged. Replace them with new ones. If the stereo speakers still do not work properly.

Chapter 6

CD-ROM/DVD Troubleshooting

```
                        ┌─────────────┐
                        │    START    │
                        └──────┬──────┘
                               │
                               ▼
                    ┌──────────────────────┐
                    │ Perform audio CD check│
                    │    (Procedure 1)      │
                    └──────────┬───────────┘
                               │
                               ▼
                          ╱─────────╲                    ┌──────────────────┐
                        ╱             ╲      No           │ Perform drive-   │
                       │ Audio CD       │────────────────▶│ cleaning check   │
                        ╲  functions ok?╱                  │  (Procedure 2)   │
                          ╲─────────╱                      └──────────────────┘
                               │
                               │ Yes
                               ▼
                    ┌──────────────────────┐
                    │ Perform software check│
                    │    (Procedure 3)      │
                    └──────────┬───────────┘
                               │
                               ▼
                    ┌──────────────────────┐
                    │ Perform diagnostic test│
                    │    (Procedure 4)      │
                    └──────────┬───────────┘
                               │
                               ▼
                    ┌──────────────────────┐
                    │ Perform connection and│
                    │  replacement check    │
                    │    (Procedure 5)      │
                    └──────────┬───────────┘
                               │
                               ▼
                    ┌──────────────────────┐
                    │  Replace system board │
                    └──────────┬───────────┘
                               │
                               ▼
                        ┌─────────────┐
                        │     END     │
                        └─────────────┘
```
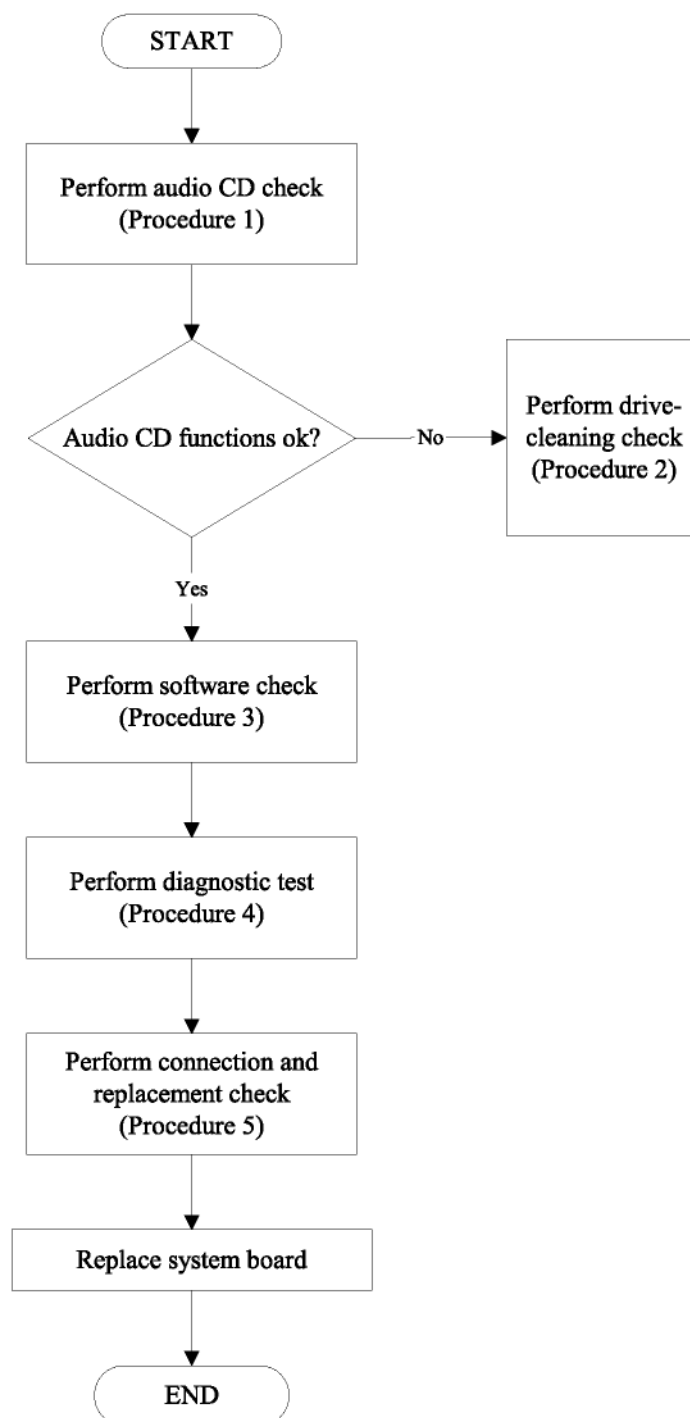
Figure 6-10 CD-ROM/DVD drive troubleshooting process

This section describes how to determine if the computer's internal DVD-ROM drive or CD-RW/DVD-ROM drive is functioning properly. Figure 6-10 outlines the process. Perform the steps below starting with Procedure 1 and continue with the other procedures as required.

- Procedure 1:   Audio CD test
- Procedure 2:   Drive cleaning check
- Procedure 3:   Software check
- Procedure 4:   Diagnostic test
- Procedure 5:   Connection and replacement check

Procedure 1   Audio CD check

First, insert an audio CD into the CD/DVD drive. If it works, the problem is not with the drive. Go to Procedure 3. If the audio CD does not work, go to Procedure 2. If the CD/DVD LED on the front panel does not light when the disc is played and the drive gives no response, go straight to Procedure 3.

Procedure 2   Drive cleaning check

Insert a CD/DVD drive-cleaning disk into the drive clean according to the drive-cleaning product instructions. If the problem persists, go to Procedure 3.

Procedure 3   Software check

Ensure that the appropriate driver has been installed on the computer for the CD/DVD drive.

Procedure 4   Diagnostic test

The CD-ROM/DVD-ROM test program stored in the Diagnostics Disk will test the drive's ability to play an audio CD, as well as the functions of the CD control buttons.
If any errors occur while executing the diagnostic program, go to Procedure 5.

Procedure 5   Connection check and replacement check

The DVD-ROM drive or the CD-RW/DVD-ROM drive connects to the system board. The drive may be disconnected, or the drive or system board may be damaged. Replacement Procedures and perform the following checks:
Check 1
Make sure the drive is firmly connected to the system board.

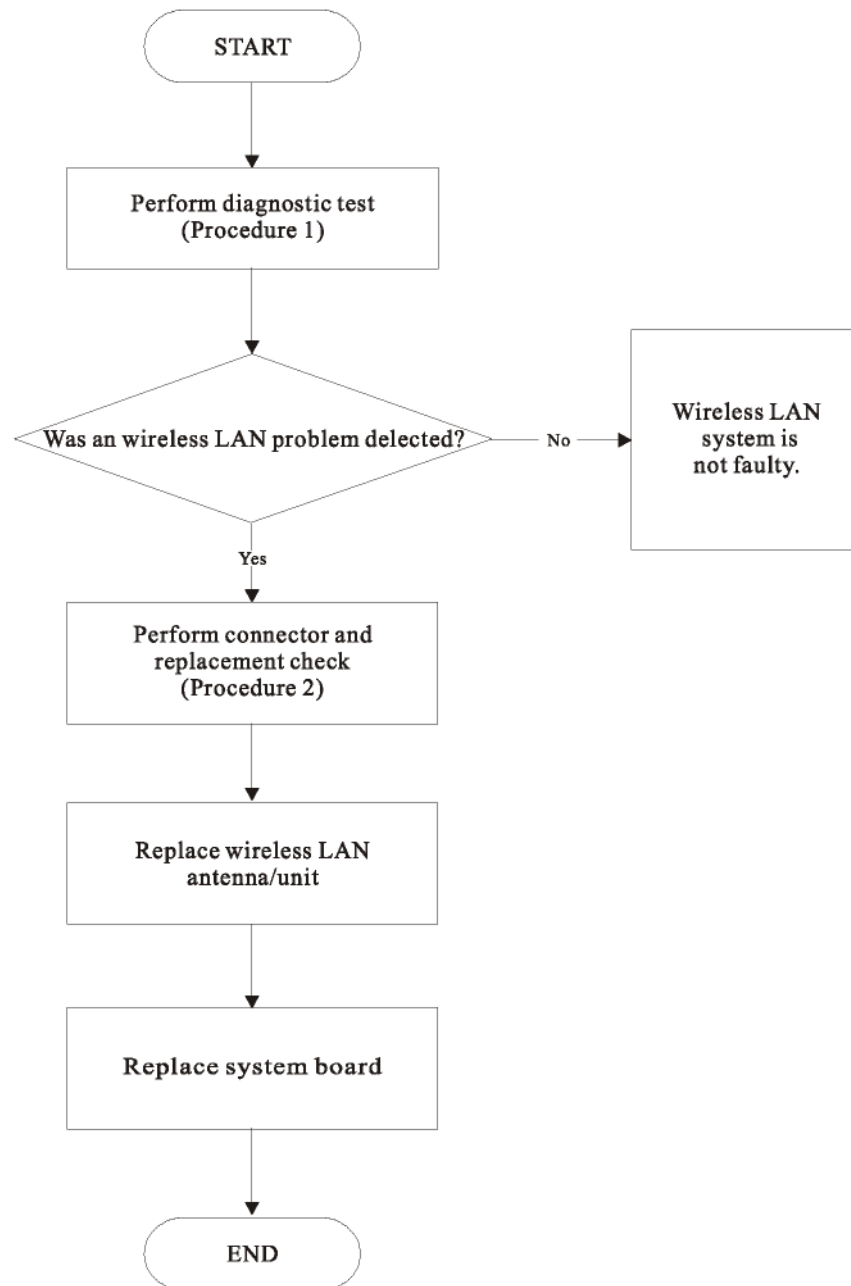- If the connection is good and there is still an error, go to Check 2.
Check 2
The drive or drive cable may be defective or damaged. Replacement Procedures.

- If the drive is still not functioning properly, perform Check 3.
Check 3
The system board may be damaged.

Wireless LAN Troubleshooting

Figure 6-11 Wireless LAN troubleshooting process

The wireless LAN antenna wire, wireless LAN unit or system board may each be the source of a wireless LAN fault. Any of these components may be damaged. To determine if the computer's wireless LAN system is functioning properly, perform the following procedures. Figure 6-13 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

- ◆ Procedure 1:   Diagnostic test
- ◆ Procedure 2:   Connector and replacement check

Procedure 1   Diagnostic test

Run the Diagnostic Program, which will automatically execute the wireless LAN test. Refer to Chapter 3, Tests and Diagnostics for more information on the program.

If an error is located, go to Procedure 2. If an error is not located, the wireless LAN system is functioning properly.

Check 1: Make sure the wireless select switch installed in your installed programs.

Check 2: press keyboard "Fn+F2" make sure wireless is enable

If the program persist .go to Procedure

Procedure 2   Connector and replacement check

The wireless LAN antenna, wireless LAN unit or system board may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks.

Check 1

Make sure that the wireless LAN antenna is firmly connected to the wireless LAN unit (refer to Chapter 4 for instructions) and that the wireless LAN unit is securely slotted into the system board.

- ◆ If the problem persists, go to Check 2.

Check 2

Check that the wireless communication switch is turned to "On", then make sure that the wireless communication LED on the front panel is lit.

If the LED is lit but the wireless LAN function is still faulty, the antenna may be damaged. Replace with a new antenna following the steps in Chapter 4, Replacement Procedures.

- ◆ If the problem persists, or if the wireless LAN LED is not lit when the wireless communication switch is turned to "On", go to Check 3.
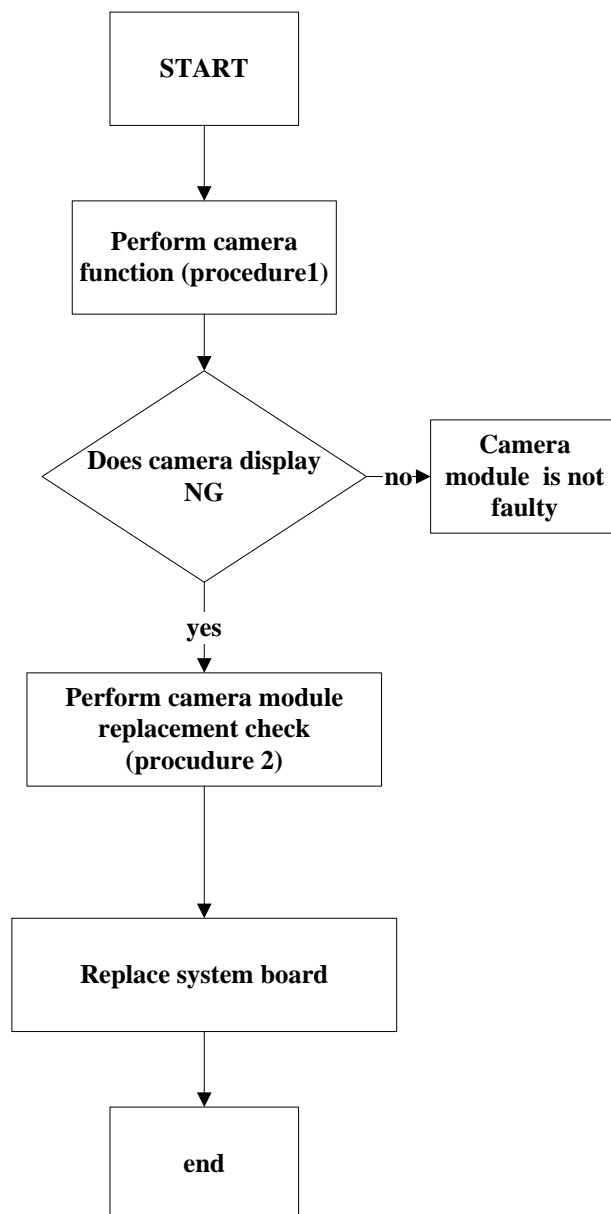
Check 3

The wireless LAN unit may be damaged. Replace it with a new one following the instructions in Chapter 4.

- ◆ If the problem still exists, perform Check 4.

Check 4

The system board may be damaged. Replace it with a new one following the instructions in Chapter

Camera function Troubleshooting

```
                    ┌──────────────┐
                    │    START     │
                    └──────┬───────┘
                           │
                           ▼
                    ┌──────────────┐
                    │Perform camera│
                    │function      │
                    │(procedure1)  │
                    └──────┬───────┘
                           │
                           ▼
                      ╱─────────╲              ┌──────────┐
                    ╱ Does camera ╲    no       │ Camera   │
                   ╱  display NG   ╲──────────▶ │ module is│
                    ╲             ╱             │ not      │
                      ╲─────────╱              │ faulty   │
                           │ yes               └──────────┘
                           ▼
                    ┌──────────────┐
                    │Perform camera│
                    │module        │
                    │replacement   │
                    │check         │
                    │(procudure 2) │
                    └──────┬───────┘
                           │
                           ▼
                    ┌──────────────┐
                    │Replace system│
                    │    board     │
                    └──────┬───────┘
                           │
                           ▼
                    ┌──────────────┐
                    │     end      │
                    └──────────────┘
```

Figure 6-12 camera trouble shooting process

This section describes how to determine if the computer's camera is functioning properly. Figure 6-12 outlines the process. Perform the steps below starting with Procedure 1 and continue with the other procedures as required.

- ◆ Procedure 1: Camera connection check
- ◆ Procedure 2: blue tooth replacement check

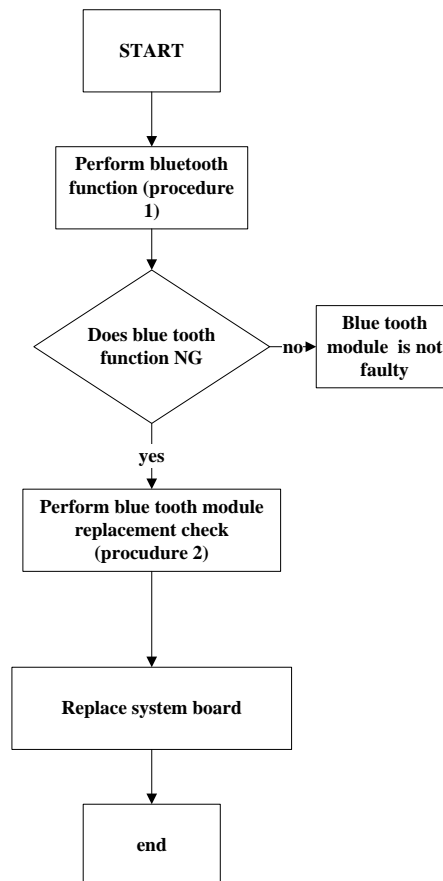## Procedure 1   Camera connection check

The Camera is connected by the Camera cable to the system board. Make sure the camera cable is firmly connected to the camera board and system board. Replacement Procedures, for instructions on how to disassemble the computer and then perform the following checks.

If any of the connections are loose, reconnect firmly. If any of the connections is damaged, or there is still an error, go to Procedure 2.

Procedure 2   Camera replacement check

The camera board or cable may be defective or damaged.

Blue tooth function Troubleshooting

Figure 6-13 blue tooth trouble shooting process

This section describes how to determine if the computer's blue tooth is functioning properly. Figure 6-13 outlines the process. Perform the steps below starting with Procedure 1 and continue with the other procedures as required.

◆ Procedure 1:   blue tooth connection check

◆ Procedure 2:   blue tooth replacement check

Procedure 1   blue tooth connection check

The blue tooth is connected by the blue tooth cable to the system board. Make sure the blue tooth cable is firmly connected to the blue tooth device and system board. Replacement Procedures, for instructions on how to disassemble the computer and then perform the following checks.

Chapter 6

If any of the connections are loose, reconnect firmly. If any of the connections is damaged, or there is still an error, go to Procedure 2.

Procedure 2   blue tooth replacement check

The blue tooth device may be defective or damaged.